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COMPUTERWORLD

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Product Spotlight — You don't need new shoes to dance with an object-oriented DBMS. Page 67.

Fault-tolerant VAX gains attention as front-end device for Vaxclusters, while takeover rumors take DEC stock for a ride. Page 4.

Strategic RISCs: Unique IBM chip design may make it tougher for workstation competitors to catch up with performance. Page 6. Sun customers are impressed by the RS/6000 but not ready to switch. Page 8.

Mainframe 1-2-3 version may cause spreadsheet purchase decisions to be made on an enterprisewide basis and help stem desktop defections. Page 12.

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Wang's debt reduced to 17% of the $575 million owed last August as company sells lease financing operation to GE Capital Corp. Page 93.

A single font standard across Macintosh and Intel hardware platforms is possible if Microsoft and Apple can deliver Postscript compatibility with their Royal outline font. Page 33.

NEWSPAPER

Downsizing quandary for IS pros

Opportunity beckons, although cutbacks often follow decentralization

BY ELISABETH HORWITT
CW STAFF

If you assume that downsizing from mainframes to local-area networks means scrapping the information systems department, you may be in for a surprise. Firms that have made the migration say IS expertise is critical both during and after the transition.

"LANs are not trivial. You have to involve IS from the beginning, or you have to do it on your own," and that can lead to a lack of quality, direction and support on the new systems, said Brian Comnes, information center manager at American President Companies Ltd.

Perhaps the most crucial role that IS plays during downsizing is to ensure that you "don't lose all the good features of the mainframe, like security and redundancy," said Brad Calcagni, manager of business system planning at PHH Homequity in Wilton, Conn.

Not that all IS staffers are willing to participate in their companies' downsizing efforts. The majority of experienced programmers at Consolidated Insurance Group, Inc. elected to leave during the company's recent migration from an IBM 3090 to Novell, Inc. LANs [CW, Feb. 19]. In addition, Fortune 500 auto parts company Echlin, Inc. lost about half of its IS staff when it made a similar move several years ago.

The extent of the IS exodus during downsizing often depends on how it is managed, according to Ted Klein, president of Boston Systems Group. "Some companies put an active emphasis on going that extra mile to help IS retrain and retool; some say, 'We're sorry, you'll have to move on,' " he said.

Such a mainframe-to-LAN

Continued on page 115

SAA office stuck in first gear

BY ROBERT MORAN
CW STAFF

IBM announced last week that it would miss its original delivery dates for Officevision 2.0, its Systems Application Architecture office strategy, by as much as nine months.

The action prompted little concern among potential customers, with several saying they have yet to evaluate their needs for Officevision and would simply further postpone any decision.

"I'm disappointed that I'm not delivering it when we'd planned, but we haven't missed the window," said Tony Mondello, IBM's vice-president for office systems in the applications solutions division.

Analysts and third-party developers generally agreed. "Officevision is just a concept, which people target and try to work toward," said Richard Finkelstein, president of Performance Computing, Inc. in Chicago. "I wouldn't say IBM was in trouble. It is just the usual situation when these things are first announced."

Jeff Tash, president of Database Decisions, Inc. in Newton, Mass., said that the delays will

Continued on page 6

EDI sprinters find partners on slow track

BY JIM NASH
CW STAFF

Electronic data interchange, the technology that was intended to link all commerce electronically, is being adopted far too slowly in the eyes of those companies that have already invested in it.

"Large companies are spending tremendous amounts of money to stay on the leading edge of this technology," said Ray Heflin, director of quick response at Dillard's Department Stores, Inc. in Little Rock, Ark. However, much of the effort and money will be for naught if smaller vendors cannot or will not participate in EDI, he continued.

Heflin said he is working with several EDI systems suppliers to develop a standardized turnkey package for less than $10,000. These attempts have been unsuccessful to date, he said.

Michael Hobbs, who is in charge of developing an EDI

Continued on page 12

BUYERS' SCORECARD

Inside

Sybase edges out competition

User satisfaction rating

Total possible score: 68

Sybase	48.5
Oracle	47.6
RDB	45.6
Ingres	45.1
Informix	44.7
Supra	44.7
SQL/DS	43.6
DB2	43.3

◀ *Sybase users gave it the highest satisfaction rating in* Computerworld's *Buyers' Scorecard survey of relational database products. More than 400 users rated products on 18 criteria. Detailed scores on page 76.*

FAA HOLDING PATTERN

Anxiety grows as traffic systems age

Second of a two-part series

BY J. A. SAVAGE
CW STAFF

Overloads on obsolete computer systems that are used by air traffic controllers consistently lead to blank or flickering controller screens, leaving controllers without crucial information on airplanes.

CPU overload has yet to be directly linked to aircraft accidents, but it has led air traffic controllers to estrange themselves from the technology they work with on a daily basis.

"Controllers don't want to hurt anybody," said Ed Mullin, Southwestern representative for the National Air Traffic Controllers Association. However, they also do not want to be blamed for any accident caused by a computer overload.

At the Dallas-Fort Worth airport, one of the nation's busiest, controllers are keeping records of computer blackouts "to cover ourselves on moral grounds," Mullin said. Controllers at Dallas-Fort Worth have documented at least 12 computer failures in the last two years, most lasting only a few minutes, but at least two of which were more than 14 minutes long, according to Mullin.

While government investigators have not been able to make a one-to-one correlation between CPU overloading and accidents, they do not discount the possibility.

"Certainly it could [cause accidents]. It's nothing to take lightly," said Joel Willemssen, assistant director of the U.S. General Accounting Office's (GAO) Information Management and Technology Division.

Willemssen's office reported that nearly 70% of the U.S.' 63 largest airports have experienced capacity problems leading to blank or flickering

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NEWS

4 While critics weren't so fault-tolerant of DEC's new VAX, users were giving a cautious thumbs-up.

4 Rumors cooked up about a DEC takeover attempt appear to be half-baked.

8 Sun users aren't dazzled by IBM's new series of RISC workstations.

8 Avon benefits from outsourcing by evaluating it — and then improving operations without it.

10 Madge Networks becomes the first firm to pick up the lawsuit gauntlet thrown by the lord of the token-ring.

12 Lotus' 1-2-3 mainframe version could act as an incentive for users not to shop around.

115 DuWayne Peterson, Merrill Lynch's million-dollar man, says he's there for the duration.

116 Europe's ancient heritage unfortunately extends to its antiquated air traffic control system, threatening airport paralysis.

116 As Congress turns a deaf ear on the FAA, it turns to outsourcing to shave costs.

Quotable

"We haven't seen a real plus yet, because a lot of people are afraid to put a lot of trust in [EDI]."

PAM SHUE
AMERICAN CYANAMID CO.

On EDI links with customers and freight carriers. See story page 1.

SYSTEMS & SOFTWARE

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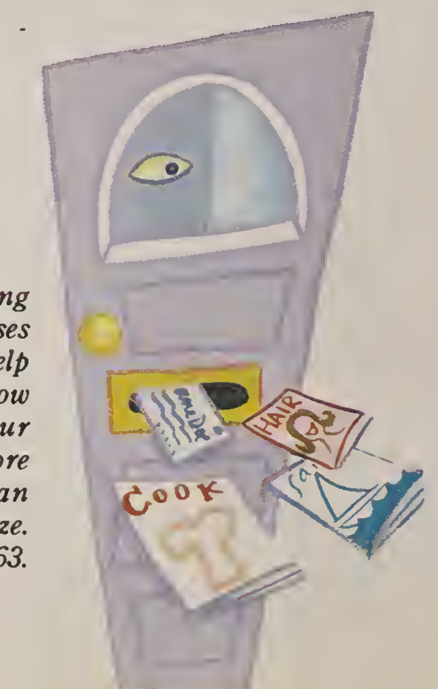
UPDATE

Time marches on. Twenty years ago, Information Storage Systems unwrapped a disk drive with the 'revolutionary' access time of 30 milliseconds. (Today's DASDs are roughly a million times faster.) Meanwhile, the U.S. Navy proudly showed a new test for Cobol compilers that took only half an hour to check out language and object programs. And then RCA chimed in with its news of the very first full lease-to-purchase program in history for commercial users. The program gave users a 'generous' 15% discount, provided they inked a six-year lease-buy contract. See, things *can* be worse.

Inventory management boosted by Pier 1 Imports' point-of-sale system. Page 37.



Marketing databases may help firms know you and your family more closely than you realize. Page 63.

EXECUTIVE BRIEFING

■ **Work-group computing, and particularly the promise** that related products are said to offer, can conjure up dreams of great productivity gains. However, before those gains can become reality, information systems managers must remember this key success factor — people. Critical to this process is motivating team players, coordinating team efforts and focusing on people resources to make work-group computing work. **Page 85.**

■ **The last person** who should face a blank or flickering computer screen is an air traffic controller, but that is happening more and more. In the second of a two-part series, *Computerworld* examines overloaded and obsolete air traffic equipment and what that means to us. While government investigators have not established a direct relationship between overloaded equipment and air traffic accidents, they do not rule out the possibility. Many of these systems will eventually be upgraded to a reduced instruction set computing platform from IBM. But for now, we are at best faced with more delays and airplane diversions. **Page 1.**

■ **Downsizing from mainframes to LANs** need not be the kiss of death for an IS department, according to managers in companies that have made such transitions. While some IS staffers may want to leave, others wishing to stay may find it rewarding. The IS groups' expertise is needed, and its value to the firm can increase during such a project. A role — even if it is a limited one — remains for IS after the downsizing project is complete. **Page 1.**

■ **We want you, and only you.** Or so you would think with a new concept of database marketing that takes the know-your-customer trend to a new level. A seller's message about its product must be tailored to the individual buyer. **Page 63.**

■ **Avon knows how to just say no.** Outsourcing may be the latest trend, but this beauty products manufacturer took a look and decided it could save money and get more efficiency on its own. CIO Raymond Perry says others can do the same. **Page 8.**

■ **Merrill Lynch's million-dollar CIO,** DuWayne J. Peterson, scoffs at recent reports that he will soon be shown the exit door. He says he is at Merrill for the duration and is not heading home to California. **Page 115.**

■ **The slow acceptance of EDI** is frustrating users who have poured money into it but now must wait for others to join the party. **Page 1.**

■ **The advent of object-oriented DBMS,** the next database wave, may not be as painful and costly a conversion as the previous advances in DBMS technology. While a hierarchical-to-network model or relational-model switch may have meant starting from scratch, a move to an object-oriented system could call for keeping your relational model and building onto it. **Page 67.**

■ **Virtual networks,** which appear to belong to you but are actually part of a public network, are beginning to emerge as an alternative to traditional leased lines. Cost-effectiveness appears to be the greatest advantage. **Page 51.**

■ **On-site this week:** Sneaker net will do for now, as the IS team at Interstate Bakeries brings together two incompatible environments while following management's mandate to keep disruptions to a minimum. **Page 25.** Pier 1 Imports looks to a personal computer-based inventory management system to ease the difficulties of doing business with such far-away ports as Bombay. The software will allow this retailer of furniture and clothing to update a mainframe-based master inventory file in real time. **Page 37.**

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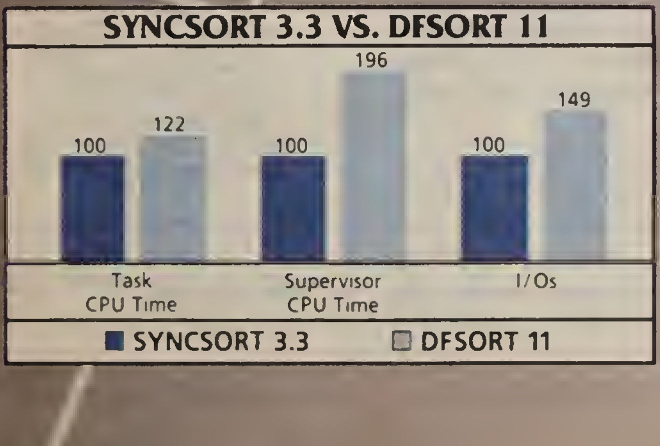

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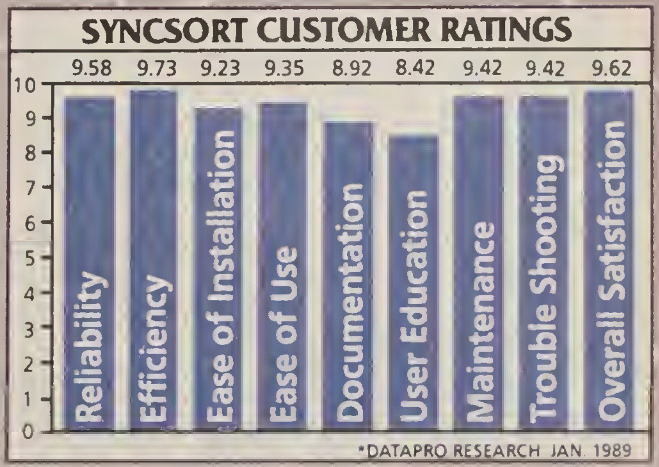

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Not everyone a critic of VAXft

BY MARYFRAN JOHNSON
CW STAFF

While critics groaned last week over the high price and middling performance of Digital Equipment Corp.'s new fault-tolerant VAX, the machine garnered a few quiet nods of approval from customers.

In businesses where never-fail computers are needed for funds transfer, trading rooms and other time-critical financial dealings, the $229,000 VAXft 3000 Model 310 does more than fill a gap in DEC's product line, several users said.

"This opens a door for us that was closed before," said Herb Zlotogorski, vice-president of global operating and information services for Bankers Trust Co.

As the third-largest money transfer bank in New York, Bankers Trust is considering use of the Model 310 as a front-end processor for one of its large Vaxclusters. "The software we've already got working on an existing DEC front end could be ported to the fault-tolerant machine," according to Zlotogorski. "That's the beauty of it for us."

Global tolerance

Trust companies that are extending their reach in the global marketplace are already feeling the need for fault tolerance, said Robert Tanner, senior vice-president of trust and financial services for Northern Trust Co. in Chicago.

"Attitudes will be changing in the 1990s about the importance of fault tolerance," Tanner said. "As transaction activity takes place across a wide variety of time zones, having the system up all the time is becoming an issue we deal with every day."

Stem-to-stern DEC shops will be the first natural selling place for the fault-tolerant VAX, Tanner and other customers agreed. Many large banks and trust companies now rely on IBM for major systems, with fault tolerance provided by front ends from Stratus Computer, Inc. and Tandem Computers, Inc.

DEC is positioning the new VAX as a front-end processor for clusters of VAXs — identical to IBM's strategy of reselling the Stratus box as an IBM System/88. The DEC machine mimics the Stratus processor with hardware-based fault detection but differs from Stratus in its software-based recovery features, more in line with the approach used by Tandem.

Both competitors downplayed the significance of DEC's entry into their territory, saying that the lone DEC model was overpriced, underconfigured and no threat to their business.

Yet, industry analysts cautioned that while the VAXft 3000 may be a defensive move to shore up installed base needs, it is only the first shot out of DEC's fault-tolerant cannon.

"It's not clear this machine buys DEC a solid place in the on-line transaction processing market," said Bob Randolph, an analyst at Technology Financial Services in Westford, Mass. "But one of DEC's strengths is its ability to rapidly build product."

Terry Shannon, an analyst at International Data Corp. in Framingham, Mass., said the VAX 6000 midrange and 9000 mainframe lines would be likely candidates for fault-tolerant boxes.

One market in which Stratus in particular "may take a lump" from DEC is in telecommunications accounts, said Robert Cameron, an analyst at Dataquest, Inc. in San Jose, Calif. When DEC eventually ports Unix System V to its fault-tolerant platform, Stratus' recent introduction of Unix on the XA2000 line will pale in importance, he said.

Good news, good news

Perhaps the best news about the new VAX for customers worldwide is that the "two big names" — IBM and DEC — both offer fault-tolerant capabilities now, said Elven Riley, a vice-president in the investment banking sector at Manufacturers Hanover Trust Co. in New York.

"It's a funny area of technology," Riley noted, drawing an analogy between fault-tolerant computers and refrigerators. "How often does your refrigerator fail? It will run a few years, then break, and the outage is a definite inconvenience. Now, is that inconvenience worth having two refrigerators?"

DEC is hoping that it will be.

"The focus for DEC is not really on fault tolerance so much as on high availability systems for transaction processing," said James Hammons, an analyst at Sierra Group, Inc. in Tempe, Ariz. "DEC is focusing on industries where it can compete with IBM."

Tolerant entry points

DEC's fault-tolerant VAX, although little threat to Tandem and Stratus pricewise, is expected to appeal to large VAX sites

	• VAXft 3000 Model 310	• Stratus XA2000 Model 30	• Tandem CLX Model 620'
Availability	June 1990	Dec. 1989	Since 1987
Number of synchronous lines	1 - 16	2 - 20	2 - 94
Number of asynchronous lines	None	4 - 80	4 - 368
Duplexed or mirrored disks	381M bytes - 1.9G bytes	152M bytes - 1.3G bytes	600M bytes - 7.7G bytes
Transaction/sec.*	9	9	5
Entry-level price	$229,000	$49,800	$79,000

* Vendor benchmark claims

CW Chart: John York

Transaction attraction

"Transaction processing" seems to be the magic phrase at Digital Equipment Corp. these days, as the minicomputer maker introduced a host of software introductions accompanying the fault-tolerant VAX.

VMS 5.4, which will be available in the second half of this year at no price increase over 5.3, includes additional support for transaction processing and distributed computing. Key components include the following:

- DECdtm, an embedded distributed transaction manager facility that will allow distributed transaction processing with complete data integrity while multiple databases are updated from a single transaction.
- DEC's own variation of two-phase commit, the updating protocol used in all distributed transaction and database operations.

An additional option, separately licensed and priced, is Decintact V2.0. The VMS layered product is a transaction processing monitor that provides an environment for developing high-performance transaction processing applications on VAXs and Vaxclusters.

MARYFRAN JOHNSON

DEC grist for takeover rumor mill

BY NELL MARGOLIS
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. took a roller coaster ride on Wall Street last week, fueled by rumors, denials and counter-rumors of a possible trans-Pacific takeover attempt.

As the week wound down, so did both the rumors and the price of DEC shares — but not without leaving a lingering sensation among industry observers that some type of deal might be brewing between DEC and one or more major Japanese vendors. Such a deal, according to analysts' speculation, is more likely an alliance than a takeover.

Rumors and denials notwithstanding, several analysts noted that DEC makes an alluring target at this point. "Let's be realistic: This is a company with a virtually debt-free balance sheet, approximately $2 billion in cash, operating cash flow in excess of $1 billion and $13 billion in revenue, [with its stock] selling right now at near book value," said John Logan, senior analyst at Aberdeen Group, Inc.

Not buying it

"It's all baloney," said Mike Geran, an analyst at The Nikko Securities Company International, Inc. in New York, of the midweek rumor that Japanese giant Mitsubishi Electronic Corp. had acquired at least 5% of DEC's outstanding shares as the opening gambit in an acquisition bid.

"I'm hard-pressed to put it any better" than Geran did, said DEC Director of Investor Relations Mark Steinkrauss. As of Thursday afternoon, he said, the company had received no notification from the Securities and Exchange Commission (SEC) concerning stock purchases by any Japanese company, including Mitsubishi and Matsushita Electric Industrial Co. Ltd., whose name had arisen during the week as well. Any stockholder who acquires 5% or more of a U.S. company's stock is required to file with the SEC.

The only investor to have made such a filing, Steinkrauss said, is Sanford C. Bernstein & Co., a New York-based investment firm that he claims has had a huge position in DEC for some time now, purely for investment purposes.

On Wednesday, DEC stock rocketed up 4¾ points to 76¾ on the New York Stock Exchange. By Thursday's market close, and in the wake of denials from DEC and its rumored would-be buyers, the stock price had settled back down at 74½.

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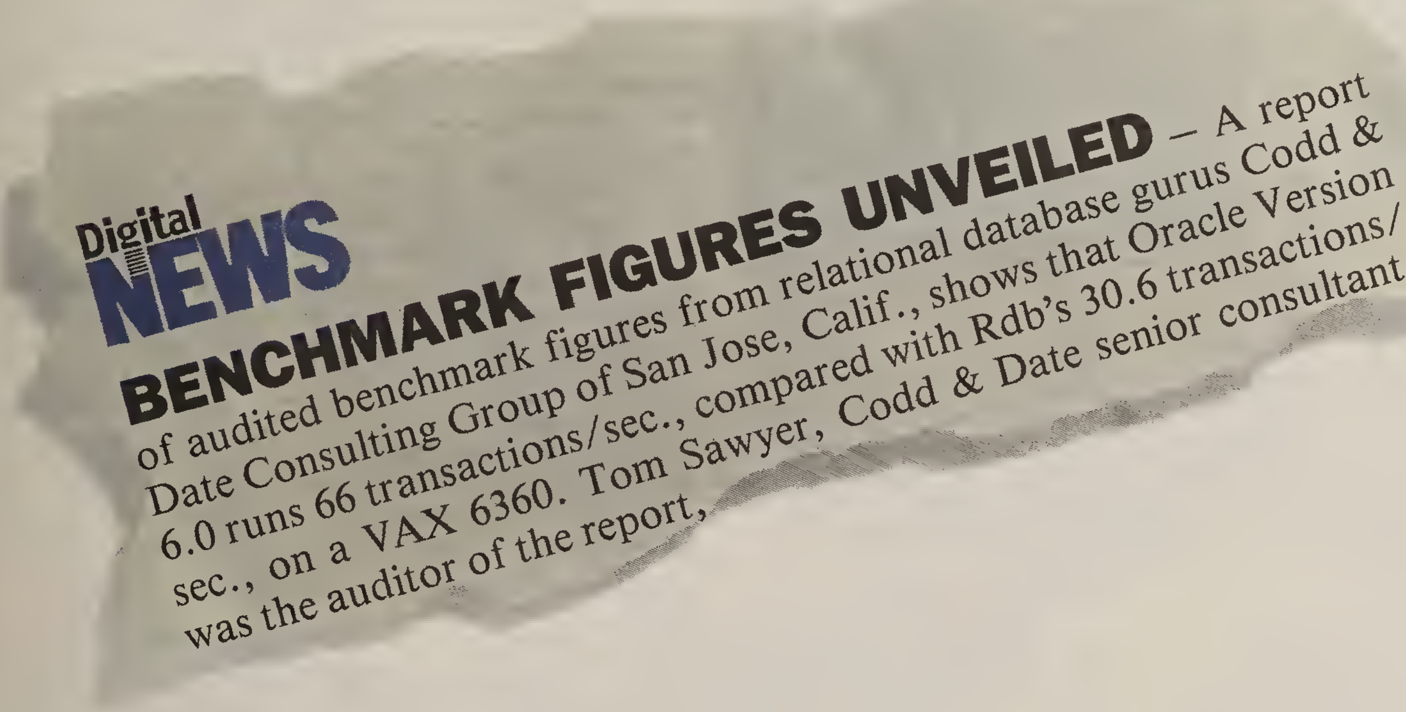
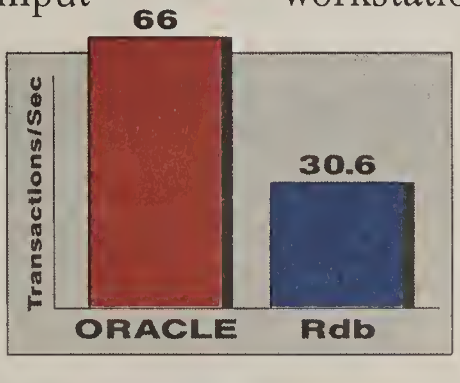


Digital NEWS

BENCHMARK FIGURES UNVEILED – A report of audited benchmark figures from relational database gurus Codd & Date Consulting Group of San Jose, Calif., shows that Oracle Version 6.0 runs 66 transactions/sec., compared with Rdb's 30.6 transactions/sec., on a VAX 6360. Tom Sawyer, Codd & Date senior consultant, was the auditor of the report,

Independent consultants confirm that the ORACLE® relational database runs over twice as fast as Rdb. In other words, Rdb on two computers does less work than ORACLE on one.



This superior performance is the result of ORACLE's advanced multi-server architecture, which fully exploits symmetrical multi-processing (SMP) VAX 6000 systems and the new VAX 9000 series.

Rdb is slow on VAXs. If you find that news disturbing, consider this: Rdb doesn't even run on DEC's newest line of fast, inexpensive workstations and servers.

The choice is yours. Stay with Rdb and look into the price of a second VAX. Or call Oracle and save both time and money. Register for the next free Oracle seminar in your area, and we'll send you a copy of the Codd & Date audited benchmark report.

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	Mobile	Mar 22*c*
AR	Little Rock	Mar 27*f*
AZ	Phoenix	Mar 13*cp*
	Scottsdale	Apr 12*fl*
CA	Bakersfield	Mar 15*f*
	Costa Mesa	Mar 27*f* Apr 19*f*
	La Jolla	Apr 17*cf*
	Los Angeles	Mar 29*fpu* Apr 21*fl*
	Ontario	Apr 5*f*
	Sacramento	Mar 7*f*
	San Diego	Mar 20
	San Francisco	Mar 22*lp* Apr 27*cf*
	Santa Clara	Mar 28*c*
CO	Denver	Mar 12*f* Apr 3*f** Apr 17*l*
CT	New Haven	Mar 6*f*
	Stamford	Mar 15*f*
DC	Washington	Mar 13*u** Apr 10*
FL	Jacksonville	Mar 21*f*
	Melborne	Mar 14*c*
	Miami	Apr 18*c*
	Orlando	Apr 12*f*
	West Palm Beach	Mar 28*f*
GA	Atlanta	Mar 8*c* Apr 5*l*
HI	Honolulu	Mar 15*fp*
IA	Boise	Apr 4*f*
	Des Moines	Mar 20*p* Apr 17*f*
IL	Chicago	Mar 7*f#* Mar 14*l* Apr 12*f#* Apr 19*u*
IN	Fort Wayne	Apr 25*f*
	Indianapolis	Mar 8*f* Apr 17*f*
KY	Louisville	Apr 25
LA	Baton Rouge	Apr 19*f*
	New Orleans	Mar 23*c*
MA	Boston	Apr 12*f*
	Burlington	Mar 8*f*
	Springfield	Apr 17*f*
MD	Baltimore	Mar 29*f#*
ME	Portland	Apr 10
MI	Dearborn	Apr 10*c*
MN	Minneapolis	Mar 6*fp* Apr 3*c*
MO	Kansas City	Mar 21*c* Apr 27*l*
	St. Louis	Mar 13*f* Apr 5* Apr 11*c*
NC	Greensboro	Mar 8*f#*
	Res Tri Park	Mar 15
NE	Omaha	Mar 13*f*
NH	Bedford	Mar 13*f*
NJ	Cherry Hill	Apr 11*l*
	Iselin	Mar 6*f* Mar 27*p* Apr 17*l*
NY	Binghamton	Mar 27
	Buffalo	Mar 15*c*
	Melville	Mar 21*f* Apr 18*f*
	New York	Mar 7*f* Mar 28*c* Apr 4*f* Apr 25*p*
	Rochester	Mar 22*f*
	Syracuse	Apr 19*c*
OH	Cincinnati	Mar 8*f*
	Cleveland	Mar 15*c*
	Columbus	Apr 11
OK	Oklahoma City	Apr 17*cf*
	Tulsa	Mar 6*f*
OR	Portland	Mar 6*c*
PA	Allentown	Apr 4*c*
	Harrisburg	Mar 22*f*
	King of Prussia	Mar 7*l* Apr 25*c*
	Philadelphia	Mar 28*c*
	Pittsburgh	Apr 19*c*
	Scranton	Mar 14*f*
SC	Columbia	Mar 20*c*
	Greenville	Apr 4*c*
TN	Knoxville	Mar 27*
	Memphis	Apr 5*f*
TX	Austin	Mar 9*c* Apr 20*fp*
	Dallas	Mar 6*cfl* Apr 19*cf*
	Houston	Mar 8*cf* Apr 12*f*
	San Antonio	Mar 13*c*
UT	Salt Lake City	Mar 7*l* Apr 24*f*
VA	Newport	Mar 13*f#*
	Richmond	Mar 22*f#*
WA	Seattle	Mar 27*f* Apr 17*cf*
	Spokane	Mar 13
WI	Milwaukee	Apr 4*f*

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COMP.WORLD

IBM box needs the speed

BY PATRICIA KEEFE
CW STAFF

IBM's claim to next-generation speed with its RISC System/6000, which is critical in stemming the stampede to other workstation vendors, relies heavily on the advantages gained via its proprietary superscalar processing as well as the manner in which it is implemented.

Both its unique chip set and the decision to put many of the RS/6000 features into silicon are keys to keeping competitors at bay in a market where players typically take less than six months to leapfrog one another. Some analysts are predicting it may take the competition up to a year to catch up to or surpass IBM's efforts.

However, there is no hardware lock-in strategy, according to William Filip, assistant general manager of IBM's Advanced Workstation Group. "Our goal is to play in a heterogeneous network," said Phil Hester, director of the group's engineering center. "We know we are in a minority position, and the only way to get good market share is to link to all the environments out there," he added.

IBM put an emphasis on support for standards throughout its announcement. It will provide connections to other workstations, primarily through support for a variety of connectivity options and protocols, including Transmission Control Protocol/Internet Protocol and Sun Microsystems, Inc.'s Network File System transport.

On the software side, Filip said that AIX, IBM's version of Unix, is compatible with AT&T's Unix System V and Berkeley System 4.3. AIX Version 3 also conforms to Posix and parts of the X/Open Portability Guide. In addition, IBM is offering OSF/Motif, the Open Software Foundation's graphical user environment, along with Next, Inc.'s Nextstep, on the RS/6000. Applications running under these environments can be ported to AIX with "few changes," according to Filip.

Although IBM said it will license AIX source code for university and developer use, it currently has no plans to license AIX for redistribution. "But never say never," Filip added.

IBM's superscalar processing may also hold the key to its efforts to promote interoperability between AIX and Systems Application Architecture, according to Robert Simko, executive director of International Technology Group in Los Altos, Calif.

"The ability to run simultaneous instructions [per cycle] allows you to make the processing very transparent to the user as to where the data resides and even as to where it can be processed," Simko said.

IBM's superscalar architecture allows the millions of instructions per second and millions of floating-point operations per second to be high enough to allow all this connectivity to occur without degradation, as well as transparently to the user, explained Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

IBM separated the processor into three functionally independent units — branch, fixed point and floating point — to permit concurrent execution of multiple instructions. "The key here is concurrent, independent, autonomous units," Hester said.

"Not only do they have an impressive CPU, but they've got a souped up bus and [small computer systems] interface," said Jon Peck, a vice-president at SPSS, Inc., an RS/6000 developer and beta-test site user.

Deep-sixing plans to buy into a Sun environment, SPSS's development group is going to replace its IBM 4381 with the top-of-the-line RS/6000 Powerserver attached to a bunch of Model 320 workstations and Xstation terminals.

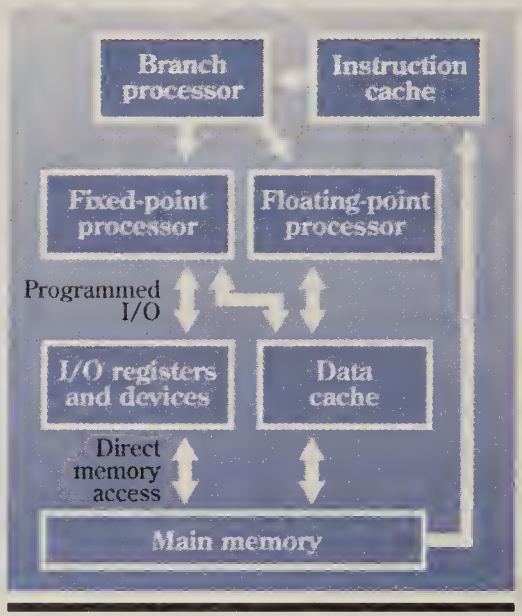
IBM said its combined superscalar architecture provides twice the integer performance and six times the floating-point performance of comparably priced Sun and Digital Equipment Corp. offerings. "If Sun does not come back with a quick and decisive retort — as in another performance increase at a price decrease — then IBM has established a window of opportunity, and Sun has a problem," Dzubeck said.

As a result, there is a fairly strong sense of security emanating from IBM executives regarding the RS/6000's impact on the heretofore unfriendly workstation market. The impetus is not that these capabilities cannot be duplicated by competitors. They will be, eventually.

But, according to Filip, the RS/6000's floating-point implementation, which enables up to five instructions per cycle, will be difficult to copy.

Power point

Independent functions for branch, fixed-point and floating-point processing enables IBM's enhanced RISC architecture to execute up to four instructions in parallel



CW Chart: Marie Haines

SAA

FROM PAGE 1

have a minimal impact on IBM's chances in the overall market. "I'm not sure who will necessarily capitalize, because I don't see anybody out there really having a dramatic offering that can compete directly."

However, an information systems executive at a large East Coast concern, who asked that his name and his organization's name be withheld, said that the delays have put off his decision to move to Officevision under MVS — and at considerable expense.

Since the company runs applications under MVS but has a large IBM Professional Office System (Profs) implementation under the VM operating system on specialized mainframes, the company could save millions by consolidating under MVS, he said.

"We want the same touch and feel implemented one time so that we don't have to go through retraining cycles," he explained.

More typical was the reaction at Ryder Truck Rental, Inc., an Application System/400 user in Miami, where a decision on acquiring Officevision has yet to be made, pending availability of functional products. Jack Mellon, director of systems development at Ryder, said the delays would make him cautious in adopting Officevision on the AS/400. "We are an IBM shop, but we are not compelled to take everything that IBM offers," he said.

Similarly, Robert Metz, a senior technical analyst at Whirlpool Corp. in Benton Harbor, Mich., and a user of Profs under the VM operating system, said that the company has not "rejected Officevision presently, but the delays will retard our decision to select Officevision under VM."

At the heart of the delays was the slipped deadline of the SAA-critical OS/2 Extended Edition 1.2, which is scheduled to be delivered in March, Mondello said. "The releases all built off the second release of OS/2, and we added more applications on top," he explained. "We realized that we needed more time to make this thing the right quality, and I added several more months on top of any OS/2 schedule changes."

Two sources, one at a third-party developer, said that IBM plans to use the delays to supply Officevision with support for four additional platforms — Microsoft Corp.'s Windows 3.0, Unix, IBM's AIX, and Apple Computer, Inc.'s Macintosh.

Mondello did say that users have requested support for those platforms and that IBM had taken that into consideration. However, he added, "we did not announce any of that stuff. I said that I will look at those things, but I have no commitments to do anything."

Release 2.0, according to Mondello, will contain detailed object manipulation features, direct connections into the three SAA hosts and new applications of calendar, library, full decision support and a tutorial manager.

As an interim strategy, IBM announced Officevision local-area network series Release 1.1, which is slated to be delivered in May 1990 and will be able to run on the new release of OS/2 Extended Edition 1.2. Upgrades from Officevision 1.0 to either Release 1.1 or Release 2.0 will not carry a charge.

But disappointed third-party developers said that their implementations will be pushed back because of the delay.

"As a vendor, we are disappointed," said John Senor, director of marketing at Information Builders, Inc. in New York. "But we think that when it does come out, the offering will be stronger, and we are fully committed." Senor said that Focus, the company's fourth-generation language, will not be integrated into Officevision until about four months after the IBM releases.

Rick Crandall, president of Comshare in Ann Arbor, Mich., said the Officevision delays will push back implementations of the company's Commander Executive Information System by about six months. "We integrate with Profs, and this means Profs will be used longer," he said.

CDs play and then work

BY CHARLES VON SIMSON
CW STAFF

SAN FRANCISCO — At a conference characterized by animated fighting chessmen and the latest in video golf, Microsoft Corp. actually managed to get some work done.

Microsoft took the opportunity of its annual conference on compact disc/read-only memory (CD-ROM) technologies to announce that it had lined up the majority of the best multimedia tools developers for the Apple Computer, Inc. Macintosh platform to commit to developing similar tools for the IBM Personal Computer under the Windows interface over the next year.

"Microsoft has co-opted all of Apple's best developers," said Stewart Alsop, publisher of "PC Letter," an influential newsletter. "While the Macintosh is clearly out front in multimedia, the announcement may serve as leadership on the IBM side."

Among the more than a dozen companies included in the announcement were Farallon Computing, Inc. and Macromind, Inc., two leading Macintosh CD-ROM and multimedia developers. The announcement included no products or shipment dates.

"This year, the multimedia applications for the PC are in development, and next year you will see a number of real systems up and running," said Pamela Goldschmidt, product manager at Microsoft's multimedia systems group. "We are talking about a short-term time frame."

The lag behind the Macintosh in multimedia is not due entirely to software developers. While IBM was demonstrating a CD-ROM drive for the Personal System/2 line, it has not yet been formally announced. Toshiba America, Inc. is shipping a CD-ROM kit selling for approximately $1,000, including the drive and a video card. Because the CD-ROM image technology does not use the PC's CPU, any size system can typically be outfitted for a CD-ROM drive.

But even the best applications developed for CD-ROM are not likely to raise corporate eyebrows outside the area of training systems. Games and other entertainment applications, as well as some programs that are aimed at elementary schools, continue to dominate the scene.

> "NEXT YEAR you will see a number of real systems up and running."
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NEWS SHORTS

Gassee leaving Apple

The rumored departure of chief product strategist Jean-Louis Gassee from Apple Computer, Inc. became official late last week when the company said that Gassee, 45, will leave the company after "an orderly transition." Apple Chairman and Chief Executive Officer John Sculley will immediately assume Gassee's responsibilities insofar as Apple's senior vice-presidents for engineering, networking and advanced technologies will report directly to the chairman. Reports of Gassee's impending resignation, now scheduled for sometime after Sept. 30 [CW, Feb. 12], surfaced recently amid industry speculation that Sculley was hunting for a way to end product criticisms and sales slump. Gassee held his post for five years.

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Apple enters systems integration

Apple Computer, Inc. and KPMG Peat Marwick linked elbows last week to provide consulting and systems integration services to firms requiring executive information systems and decision support systems on Macintosh personal computer platforms. Termed a "strategic alliance" by both parties, the project will be known as Exis.

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Also pares prices

It is not the low-cost solution most Apple users say they are hoping for, but Apple has announced that it will decrease the suggested retail price on all models of the Macintosh SE and SE/30 personal computers, as well as its Laserwriter IINT and IINTX printers, by as much as 17%. The cost of an entry-level SE will drop to $2,569; Laserwriter IINT will cost $4,499.

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Vitalink joins frame relay team

Vitalink Communications Corp. is reportedly the third company to join forces with Stratacom, Inc. to support Stratacom's Frame Relay Interface in its products. Frame relay is an interface to an Integrated Services Digital Network that allows users of fast-packet technology to quickly packetize and route bursty voice, data, image and video traffic over such digital wide-area networks. Vitalink plans to accommodate the frame relay interface in its bridging products, which will entail software changes, and said it will announce product availability dates this summer.

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Chip buyers unite

An El Cerrito, Calif.-based company is trying to obtain the preferential pricing treatment of larger firms by forming a consortium of small companies interested in buying large quantities of Intel Corp. chips. Earnest Computing, Inc.'s chief executive officer, Earnest Cordova, said smaller firms must shop with distributors and pay the market rate for microprocessors, which is often higher than the price Intel charges the larger companies that buy directly from it. Although Intel does not sell directly to any purchasing consortiums, an Intel spokeswoman said the Santa Clara, Calif., firm would not rule it out.

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IBM, Case pursue library of future

Case Western Reserve University of Ohio and IBM last week unveiled plans to develop a prototype computer-based library information delivery service. The service will give both faculty and students immediate access to written, visual and audio information at their individual workstations, the university said. The study will take approximately two years to complete and has a projected total cost of $1.6 million.

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How strong an industry?

Claiming that recent reports of a computer industry slump are flawed because they focus on high-profile layoffs at publicly owned companies, International Data Corp. last week said end-user spending on computer products in the U.S. grew by 9% in 1989 to $103 billion. IDC said the industry looks much healthier when sales by privately held companies, such as those in software, services and systems integration, are factored in.

More new shorts on page 115

Sun users staying loyal, for now

BY JAMES DALY
CW STAFF

WASHINGTON, D.C. — Although IBM fired several technological shots at Sun Microsystems, Inc. during the introduction of its RISC System/6000 workstation series two weeks ago, IBM's claims are beading off Sun users like water off a duck — at least for now.

Sun customers surveyed during last week's three-day Sun Expo DC conference said that while they are initially impressed with how the IBM offerings look on paper, they have no plans to switch over to the muscular new kids on the block.

The legendary loyalty of Sun users held fast in many areas, with most stating that Sun offers a reputation they can bank on. "Sun's been out there for years with lots of good software packages and good machines. All of IBM's claims can't erase that," said Phillip Muck, a design engineer at Dataram Corp., a maker of add-in memory products in Princeton, N.J.

Particularly troubling is IBM's ragged history in the workstation market. The ill-performing IBM RT PC became a notorious dog shortly after its introduction in January 1986, and IBM quickly began to give short shrift to the machine destined to become one of the biggest clunkers in the computer industry.

'IBM seems to back off if a new product is not an overnight sensation," said John Sieffert, a manager at Hydro-Pac, Inc., a Fairview, Pa., manufacturer of high-pressure equipment.

That seems unlikely to happen this time around — the smell of money is too strong. IBM currently maintains less than a 2% share in the sizzling $6.1 billion workstation market, which market researcher Dataquest, Inc. expects to experience 30% annual growth during the next five years. Meanwhile, Sun posts a 29% market share, the researcher said.

Users also noted that the RS/6000's use of the Unix operating system may inadvertently help Sun, an early advocate of the open Unix environment. "IBM could make Unix more acceptable and really open up the market for Sun," Sieffert added.

But if IBM does sway others to Unix, new customers may head toward the IBM option. "I'm more loyal to Unix than to Sun," said one federal government laboratory user who requested anonymity. "If it's a fast and inexpensive Unix box, I don't care much about what name is on it."

During the splashy rollout, IBM also played up the product warranty the RS/6000 offers: one year, as opposed to the 90-day guarantee Sun provides. But many Sun customers said that with enough dickering, the guarantee can be extended or price adjustments made.

Ultimately, financial and logistical hurdles may force IBM to settle for attracting new customers rather than converting established Sun users. "The IBM machines look good, but we've got millions of dollars worth of Sun equipment," said Jeff Bauer, a systems analyst at General Electric Co. in Philadelphia. "A switchover [to IBM] would be a nightmare."

Internal IS can benefit from outsource review

BY ALAN J. RYAN
CW STAFF

NEW YORK — Outsourcing has been very, very good to Raymond S. Perry.

But Avon Products, Inc., where Perry is vice-president of information services, is not interested in outsourcing its information systems operations.

When Avon was looking at ways to cut costs, Perry took a hard look at the possibility of outsourcing some of the systems work. The result was improved internal operations, which some outside facilities managers said they could not match, and savings of $2.7 million.

Avon's Perry

Speaking at a Yankee Group, Inc. conference on outsourcing last week, Perry said firms that evaluate the possibility of outsourcing will usually discover many areas where they can improve operations with or without it.

Using the results, Perry has gone to work, consolidating Avon's six separate U.S. data centers into a centralized IS department in Rye, N.Y.

"Avon doesn't fit the mold — or today's definition of it," to benefit from outsourcing, Perry said. That does not mean it is out of the question in the future, he added: "As it changes, it may be worth looking at it. I'm not permanently against it."

The length of outsourcing contracts — often 10 years — means that the wording of the contract is extremely important. If Avon were to acquire another company and increase its computing needs, Perry said, his contract would have to contain carefully worded provisions to ensure that the facilities manager would continue to provide the same level of service.

John Hammitt, vice-president of IS at United Technologies Corp. in Hartford, Conn., agreed. "I used to be able to take the experience of the past and project it into the future and largely succeed" with systems, he said. "That is not so anymore." The uncertainty of the future computing environments should be a consideration for companies locking themselves into long contracts with outsourcing providers, he said.

At United Technologies, Hammitt said, outsourcing is not a necessary alternative now. "If it becomes a larger problem, we will form alliances" with outsourcers, he added.

For now, after assessing its future needs, IS capabilities and financial and technical resources, United Technologies will reduce the number of its data centers from 12 to three or four and will centralize management of the centers, Hammitt said. "We have chosen to do insourcing."

The initial investment from 1989 through 1992, Hammitt said, will be between $35 million and $55 million. While the internal rate of return on that spending will only be 8% between now and 1992, he said, the internal rate of return is expected to climb to 95% by 1998.

It took the Eastman Kodak Co. three years to make its decision to outsource, according to Henry Pfendt, director of information technology services at Kodak in Rochester, N.Y. The $13 billion company made the move because it had enormous, outdated systems and a dysfunctional infrastructure; it also wanted to bring IS into the lines of the company's various business groups.

For Kodak, "experience is not the best teacher in the field of information technology," Pfendt said, because the field is constantly changing. That is why Kodak is moving to a centralized infrastructure with decentralized applications, he added.

Pfendt said that the move to outsourcing redefines the top IS executive's role, increasing the strategic focus of the job.

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Token-ring patent challenged

BY JOANIE M. WEXLER
CW STAFF

The longtime lucrative settlement efforts of the original holder of the patent for token-ring technology hit a snag last week when Madge Networks, Inc. decided it will challenge the patent in San Francisco's U.S. District Court.

Inventor Olof Soderblom, who has reportedly negotiated royalty settlements with 50 token-ring manufacturers, including IBM, Proteon, Inc., 3Com Corp. and Hewlett-Packard Co., recently filed suit against Madge — and went up against the first vendor willing to go to court to contest the patent, filed in 1968 but not issued until 1981.

"We sincerely believe his patent doesn't apply to token-ring and that it inhibits the development of the technology in the industry," explained Ed Murray, Madge's director of operations for North America, who said Soderblom is asking for royalties of 3% on sales of Madge's token-ring products. Murray said a court date has not yet been set.

Madge claimed that the patent deviates from today's industry-standard networks in that it specifies a master/slave — rather than a peer-to-peer — configuration and does not cover closed-transmission loop token-passing technology.

One former token-ring defendant, 3Com, is worried that the next patent-related issue to rear its head will be Fiber Distributed Data Interface (FDDI), an emerging standard for high-speed fiber token-ring local-area networks.

Since Soderblom's token-ring patent does not specify speed or a transmission medium, FDDI could also be covered by Soderblom's patent.

3Com, which settled with Soderblom in April 1986, is paying the inventor royalties on every token-ring product it sells, according to Bill Swift, product marketing manager. While Swift would not disclose the exact settlement amount, he acknowledged that "it's a large enough chunk that people gulp when they write the royalty checks."

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Autodesk targets new breed

BY ELLIS BOOKER
CW STAFF

CHICAGO — Autodesk International, maker of the top-selling computer-aided design (CAD) program for personal computers, has designs on the mechanical engineer, now the high-end user in the CAD marketplace.

The Sausalito, Calif.-based firm said it had signed an agreement to license the ACIS geometric modeling technology from Spatial Technology, Inc. in Boulder, Colo., and that it had obtained nonexclusive rights to AGlib, geometry software for modeling curves and surfaces from Applied Geometry Corp. in Seattle.

According to company officials, the two agreements give Autodesk the features needed to expand its software business beyond architectural designers, its original and primary market.

"We want to be a $500 million company in three years," company spokesman Andrew Zarrillo said. For the fiscal year ended Jan. 31, Autodesk posted revenue of $178 million. In January, it began shipping an OS/2 version of Autocad, which has also been ported to Sun Microsystems, Inc., Hewlett-Packard Co.'s Apollo division and Apple Computer, Inc.'s Macintosh platforms.

Zarrillo added that the next version of Autocad will add three-dimensional drafting and visualization, two critical elements for sending CAD data to manufacturing applications.

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COMPUTERWORLD

Lotus 1-2-3/M a budding boon

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Last week's delivery of a mainframe version of 1-2-3 could swell the coffers at Lotus Development Corp. by stifling defections to competitive products, rather than spurring big sales of the host-based spreadsheet.

Analysts predicted that users who would previously have made spreadsheet decisions based on a desktop perspective would now start deliberating from an enterprisewide viewpoint.

Lotus and IBM last week unwrapped 1-2-3/M, which is expected to appeal primarily to users seeking to consolidate desktop-based spreadsheet data into a master file on the host. It will also allow users to access data located in host databases and to exchange data with other versions of 1-2-3, including 1-2-3/G and Sun Microsystems, Inc.'s recently announced 1-2-3/Sun [CW, Feb. 26].

These capabilities will not come cheap. Pricing ranges from $15,360 to $47,470, depending on the processor, with additional monthly charges ranging from $538 to $1,800, said IBM, which will distribute the product.

Most observers expect that 1-2-3/M will find a reasonable audience, but none see it as a big money-maker. "A lot of corporations will want to run it somewhere for data consolidation purposes, but it won't be a huge product [for Lotus]," said Jack Karp, an analyst at Meta Group, Inc. in Stamford, Conn.

At the heart of Lotus' spreadsheet strategy is account control, said David Bayer, a financial analyst at Montgomery Securities in San Francisco. The idea is to make sure that users will be able to run 1-2-3 regardless of the environment. It will also provide a method for backing up and securing data located in desktop-based spreadsheets.

All of this could spell bad news for 1-2-3 rival Excel. Microsoft Corp.'s graphical spreadsheet has been able to exploit holes in Lotus' spreadsheet lineup, first with the delay of Release 3.0 and then with its OS/2 offering.

Lotus is expected to ship an OS/2 version of 1-2-3 that supports IBM and Microsoft's OS/2 Presentation Manager graphical interface this quarter.

"If Lotus had had this product [1-2-3/M] ready a year and a half ago, it could have staved off the challenge that Excel is now posing," said Jim Hammons, an analyst at Sierra Group, Inc. This has not been lost on Lotus: A source there said that the company is hoping 1-2-3/M, which is based on 1-2-3 Release 3.0, will spur 3.0 sales.

Lotus, of course, remains firmly entrenched with an estimated 60% to 70% of the spreadsheet market. But Hammons said a January survey of Fortune 500 purchasing plans projects a 1% drop in 1-2-3's market share, to 51.2%. Excel, meanwhile, has an installed base of 16%, which is expected to jump to 21.1%. The survey was conducted prior to the announced delivery of 1-2-3/M. Hammons said there will be a follow-up survey.

The arrival of 1-2-3 on the mainframe scene is not expected to "legitimize" or otherwise affect the existing niche market for mainframe-based spreadsheets. Analysts claimed there is little demand for these products.

Frank King, senior vice-president of Lotus' Software Products Group, said the company will rely on third parties to link 1-2-3/M to popular host-based financial tools. Target applications include the corporate budget process, product strategizing that spans multiple departments and large models that require consolidation among numerous spreadsheets dispersed throughout a firm.

> "IF LOTUS HAD had this product ready a year and a half ago, it could have staved off the challenge that Excel is now posing."
>
> JIM HAMMONS
> SIERRA GROUP, INC.

Tight market sets stage for Baxter layoffs

BY ELLIS BOOKER
CW STAFF

DEERFIELD, Ill. — Facing a tight U.S. hospital supply market and an acknowledged top-heaviness in its 2,000-person corporate staff, Baxter International, Inc. disclosed some details last week about a major corporate staff reorganization and reduction that began two weeks ago.

The plan for the full reorganization, due to be completed by the end of the month, includes the reduction of Baxter's information resources group, which now employs between 750 and 775 people, according to Joe Madonia, a vice-president of human resources for the information resources group.

Employees are being informed that they are being "retained," "severed" or have a "status undetermined," said Madonia, who was unable to provide details on the ultimate size of the information systems group or what IS projects had been canceled or postponed as a result of the reorganization.

Baxter Healthcare Corp., which is the U.S. operating subsidiary of the $7.4 billion Baxter International, utilizes a dedicated order entry system that has commonly been cited as a textbook example of the use of IS for strategic advantage since it was introduced more than 10 years ago by American Hospital Supplies, which is now part of Baxter.

EDI

FROM PAGE 1

system for The May Department Store Co.'s Lord & Taylor division, said retailer frustration is rising. EDI can abbreviate the time that purchased goods sit in trucks and on loading docks. The sluggish pace of EDI acceptance, he said, delays savings that could be gained from quicker inventory turnover.

Hobbs suggested relaxing antitrust regulations for vendors, retailers and manufacturers to allow them to collaborate on interchange systems. Attorneys for retailers discussing joint action on EDI warn participants against discussions that might be interpreted as pricing collusion, Hobbs said. While he said he was unsure that deregulation is the best answer, Hobbs said something must be done.

Wanda Rivera, purchasing supervisor for G. D. Searle, said, "Any kind of perk or benefit [for new EDI users] would be good." Rivera said that about six of her vendors now have some form of EDI, and she would like to see that number grow. Rivera said many users are not convinced EDI's benefits will outweigh its start-up costs.

One company, American Cyanamid Co. (AC), has taken the plunge despite a lukewarm reaction from its customers and freight carriers. AC's Chemicals Group in Charlotte, N.C., has been using a personal computer version of EDI for about 2½ years. Pam Shue, supervisor of administration for the Chemicals Group, said a mainframe application is currently being installed.

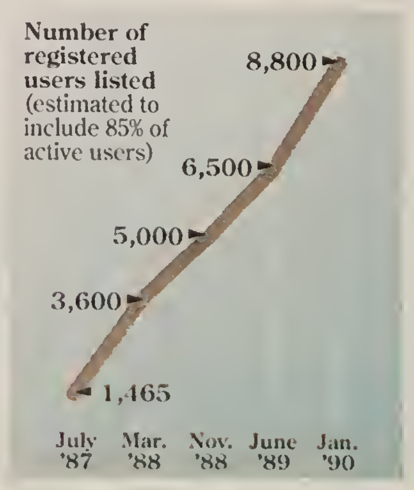
"We haven't seen a real plus yet, because a lot of people are afraid to put a lot of trust in [EDI]," Shue said. The group has three or four customers who are using EDI, but only experimentally; they continue to work primarily on paper, she said. Shue will focus this year on coaxing the group's 150 freight carriers to use EDI.

John Chay, IS vice-president of the National Retail Merchants' Association, echoed Shue's complaint. He cited the "information gap" between EDI users and companies that remain undecided. Chay suggested standardization of terms, hardware and software as one strategy to bring more companies onto EDI.

A California congressman said that he has received numerous requests for federal incentives encouraging EDI use. U.S. Rep. Esteban Torres (D-Calif.), who chairs the House Subcommittee on Environment and Labor, is considering spring hearings on government incentives to EDI users, according to an aide, Jorge Haynes. One option would be for Congress to encourage the standardization of EDI equipment, Haynes said.

Steady growth

The number of users registering EDI programs has grown by impressive increments



Source: EDI Yellow Pages International
CW Chart: John York

When push comes to shove

Dillard's Department Stores gave its 800-plus key suppliers an ultimatum last summer: Plug into EDI or find another buyer.

Specifically, Dillard's told vendors they had until Feb. 1 to pick up electronic data interchange (EDI) or at least submit a schedule for doing so in 1990. Ray Heflin, Dillard's director of quick response, admitted the announcement caused a bit of chaos among suppliers. But Heflin dismissed criticism of the move. EDI, he maintained, is essential to Dillard's future and the economy's health.

"EDI is undoubtedly a benefit to this country," he said. However, while many vendors may agree with Heflin, they nonetheless were startled by the ultimatum.

"There was quite a bit of dissension among the ranks" of vendors when the word came down, said John Keener, MIS director at Buster Brown Apparel, Inc. "We [Buster Brown Apparel] were ready for EDI," he said. "This made us go." The company is testing a personal computer-based application. He said the conversion — not counting labor — has cost "in the $10,000 range."

Henry Quiroga, DP manager for Joujou Jeans, Inc., said his firm has requested an extension while it weighs its options. Joujou executives feel they do not have the production volume to justify EDI, Quiroga said. He added that most suppliers still resisting Dillard's edict do not have the volume to justify EDI.

Some small specialty wholesalers, such as leather glove-maker Fownes Bros. Co., do not have a choice.

"If it were up to me, we wouldn't do it at all," said Mike Beniaminovitz, Fownes' DP manager. Though a relatively small producer, Fownes depends on its business with Dillard's. Beniaminovitz chose a setup based on an IBM-compatible PC. Combined with Foretell Corp.'s ESP II software, he said he has spent about $7,000, excluding in-house labor.

Nina Footwear Co. looked at EDI as "a necessity," EDI-UPC coordinator Larry Reines said. "All the majors are going to be doing this." However, Dillard's move surprised Nina with its suddenness and finality, Reines explained. He claimed Nina received only 45 days warning of the deadline.

Fortunately, Reines said, Nina had already installed a PC-based connection with its European office. That experience helped prepare executives for the rushed EDI adoption.

JIM NASH

February 15, 1990
IBM introduces RISC SYSTEM/6000
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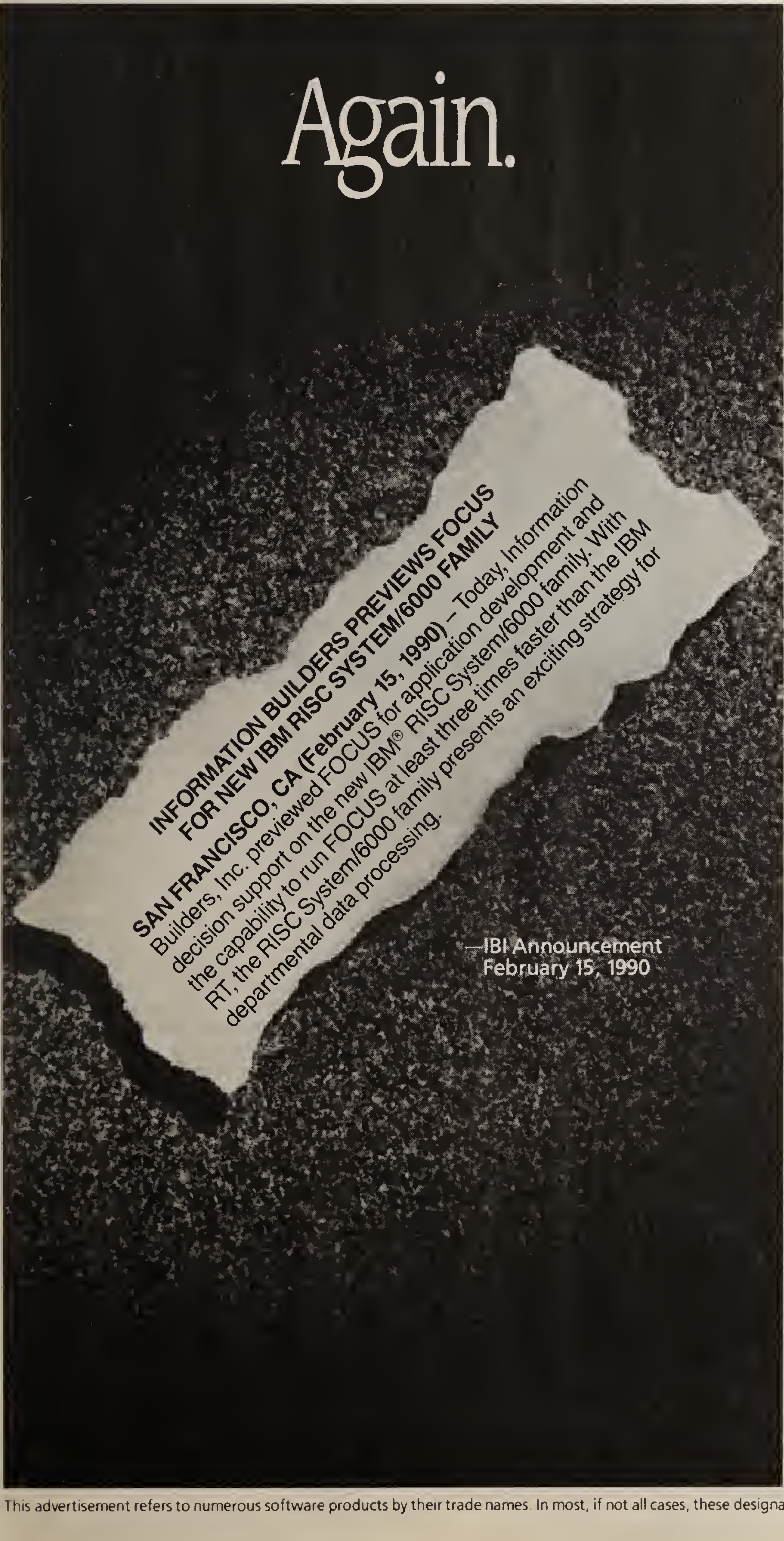

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February 15, 1990

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ADVANCED TECHNOLOGY

Going down the road feeling smart

Experiment with automobile navigation, sensor systems could alleviate traffic jams

BY MICHAEL ALEXANDER
CW STAFF

Mick Wiggins

Many fans of James Bond fondly remember the Aston-Martin DB6 sports car that sped 007 over twisting roads through the Swiss Alps in pursuit of Auric Goldfinger, the villain in the film *Goldfinger.* In addition to a passenger-ejection seat and machine guns mounted in the grille, the Aston-Martin had one other indispensible device necessary for travel over mean streets: a vehicle navigation system capable of pinpointing Bond's location and that of his adversary on the road several miles ahead.

To keep traffic flowing smoothly and safely in the years to come, many transportation experts are counting on "smart cars" like Bond's to get American drivers out of jams.

Traffic delays already cost the U.S. more than $73 million per year in lost productivity, according to the Federal Highway Administration. The nation's 110 million commuters spend two billion hours per year sitting in traffic, and delays will increase fivefold by the end of the decade, the agency said.

AUTOMATED highway sensor systems could be installed in 50 U.S. cities by 2005 at a $15 billion cost.

The solution is likely to be some combination of intelligent vehicles equipped with on-board computerized navigation systems and "smart highways" lined with sensors that would measure the flow and speed of traffic. The sensors would relay data about the amount of traffic to a computerized traffic control center, which would communicate with each vehicle on the road and periodically regulate its speed without the driver's intervention.

There are several roadblocks impeding work on intelligent highway systems, however. Research alone would take expenditures of $100 million per year for the next 10 years, according to Robert Ervin, co-director of the intelligent vehicle highway systems program at the University of Michigan. Ervin said he figures that automated systems could be installed in 50 U.S. cities by 2005 at a cost of $15 billion.

What form that smart highway infrastructure would take and precisely how the needed computer intelligence would be distributed among autos, alongside highways and at control centers is still being debated. A larger hurdle would be developing the software standards and protocols to regulate communications between vehicles and roadside, Ervin said.

"These systems are not going to spring full-blown all at once," said Earl Shirley, chief of the division of new technology and research for the California Department of Transportation (Caltrans). What will likely happen is that the automobile industry will introduce vehicles with basic intelligent systems and then gradually enhance them in subsequent models after consumers have had a chance to become accustomed to the technology, Shirley said.

One goal for intelligent-vehicle systems is to enable motorists to lock their cars in a platoon formation and travel a couple of feet apart at high speed with complete safety, for example. A radar system would allow drivers to lock onto vehicles ahead of them and maintain a constant speed and distance behind. Motorists would still be able to steer, but once cars were in the platoon, the radar would take control of acceleration and braking.

An interim step to this so-called "platooning" capability would be vehicles equipped with collision-avoidance systems that would warn drivers to slow down if their speed exceeded safe traffic conditions.

California, whose traffic jams are legendary, leads the nation in experimenting with smart highway technology. Los Angeles is testing an automated traffic monitoring system that can be used to adjust the timing of traffic lights and to divert traffic away from congested areas.

"In our planning for new traffic operation centers, we are installing computer hardware and software that could handle intelligent highway systems," Shirley said.

Caltrans, along with General Motors Corp. and the Federal Highway Administration, is also a participant in a three-year, $1.6 million study begun in 1988 called the Pathfinder program, which aims to determine the effects of navigational systems on travel time. The three groups have equipped each of 25 Oldsmobiles with a $1,400 Robert Bosch Travelpoint, an on-board navigational system.

Motorola, Inc. has set up a business unit to research intelligent highway systems, and IBM and AT&T are among the many companies quietly examining what could eventually be a lucrative market.

European and Japanese automotive and electronics industries have been toying with intelligent vehicle systems for several years already. Dutch conglomerate Philips N.V., for example, has developed a system with a map display and a synthesized voice to guide drivers to their destinations. The system, called Carin, is slated to be on the U.S. market by 1992, according to Philips.

TECH TALK

Look for 500 million "computers on a chip" to be in use by 1995, according to a new report by Frost & Sullivan, Inc. The research firm says that the market for the ubiquitous devices will almost double from some 300 million in 1989. Among the more exotic uses of the thousands of applications for microprocessors and microcontrollers are skidometers, which measure speed and elapsed time on the slopes.

……

Researchers at Battelle Memorial Institute's electronic systems business group have devised a video instrumentation system that can freeze action at the rate of 200 to 12,000 frames per second. The system combines a personal computer, automatic event-detection processor, high-volume memory and other electronics. Possible applications of the technology include industrial and scientific testing scenarios, inspection systems and medical research and documentation.

……

Computers are becoming more adept at reading handwriting with greater accuracy. Scientists in the artificial intelligence laboratory at Nynex Corp.'s Science and Technology Center have received a patent for their intelligent character recognition system that uses neural network technology to read documents that have been scanned into a computer and digitized. The technology could be used by financial institutions, utilities and a wide variety of other businesses that receive and process checks, scientists say.

……

Former President Ronald Reagan's videotaped deposition in the John Poindexter trial could set a precedent for the limits of executive privilege. If future presidents agree to testify in subsequent investigations, Videotelecom Corp. will be ready. The Austin, Texas-based firm has set up a court reporting videoconferencing network that is the first to use full-duplex audio and interactive data and graphics.

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FROM: Lab 041B
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…ched are the clinical trials results fo… submission. We will have results fr… …aining test groups by Friday...two wee… …hedule!

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EDITORIAL

Topsy-turvy

IS THE WORLD upside down or is it really flat?

This week's Buyers' Scorecard ratings of relational database products show some results that might evoke equally screwy questions.

Consider that of the eight products surveyed, IBM's DB2 finished dead last in the overall ratings. In fact, DB2 pulled up the rear in seven of the 18 criteria tested (compared with the overall winner, Sybase, which finished first in eight of the 18 criteria).

However, when the 61 users of DB2 polled were asked if they would buy the product again, only one replied "not likely." In contrast, 10 of the 60 DEC RDB users polled said they would not be likely to purchase RDB again, although RDB was rated second overall. And 18 of the 61 Cincom Supra users said they would not be likely to buy that again. Why? Because they are switching to DB2!

A look between the lines of our survey reveals some compelling reasons for this apparent anomaly in buying habits. When asked which of the 18 criteria was the most important, users ranked system reliability No. 1. This is also the one category in which DB2 topped the list.

Before we go castigating mainframe users for their conservatism, let's all remember one thing: All the bells and whistles in the world, all the great end-user tools and auditing functions, all the security features and SQL extensions are really pretty irrelevant if the system crashes and can't be brought back up efficiently. Given the mission-critical applications resident on large systems, this kind of conservatism deserves some praise.

Every last drop

A group from D.C.'s got a clue
To squeezing more dollars from you
For disk duplication
Sans authorization
Pay double or they're gonna sue.

The SPA's aiming this shot
At your boss, but please don't get hot
Its request is oblique
All it wants is a peek
At every PC that you've got.

With all these new bucks in the bank
Each maker of software should thank
This industry savior
For helping him pay for
The gas in his new Porsche's tank.

Lest vendors should harbor some fears
That users won't greet this with cheers
Don't worry, don't fret
This stuff shouldn't set
Your relations back more than 10 years!

News Item: Software Publishers Association threatens lawsuit if companies don't agree to PC software audit.
OH SURE, THEY'RE A LITTLE SMELLY, BUT WONDERFUL AT LOCATING THAT EXTRA TRUFFLE FOR THE PÂTÉ.
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LETTERS TO THE EDITOR

Irresponsible

I am a long-time subscriber to your publication and generally find it well written and informative. However, in my opinion, the article "What color is your resume?" [CW, Jan. 15] by Mark Duncan is not only nonsense, but your printing of it borders on the irresponsible.

If I understand Duncan correctly, if a manager does not want to read a resume longer than two pages, he is probably a poor manager and you should not want to work for him. The fact is that resumes are read by several people in an organization from personnel through senior IS executives. These people receive tons of resumes. It had better be brief and — more important than anything — *scannable.* Additionally, a good professional (especially in systems) should be able to present facts both clearly *and* concisely.

Duncan says your resume should look different than the others so it will stand out. If different forms are more effective, why doesn't everybody use them? There is a reason the reverse-chronology resume has become standard: It is what we want and what we expect. To date, it is the single most effective format for presenting one's responsibilities and accomplishments that there is.

Along the same lines, the article advocates "eye-catching packaging" and "aesthetic" colors. A resume is a business tool. It must not be cute. If you *must* deviate from a high-quality white bond or pale ivory "buff," the only marginally acceptable alternative is a very pale gray.

Duncan says, "A resume . . . must be a reflection of oneself in tone, appearance and style." Wrong. That is what a personal interview is for. A resume should be free of personalization or editorialization. It should be an objective account of the author's professional and educational career presented in such a way as to highlight those aspects that a potential employer would find the most attractive.

I am not saying there is absolutely, positively only one way to write a resume. I am saying that there is one form that has simply proven itself to be the most effective.

Allan D. Grossman
Senior Partner
A. Davis Grant & Co.
Iselin, N.J.

The bright side

Janet Ruhl's article "Breaking into the small time" [CW, Jan. 29] is misleading and discouraging to the first-time author. I do not know of any author of books for information systems professionals who wrote a book expecting to get wealthy from the sales of the book. I can tell you firsthand that many of them prosper in other ways because of exposure and recognition.

The article stressed the negatives. I believe the positives are more important. The production cycle is three to five months for the majority of books that QED publishes. We publish between 24 and 32 new titles each year, and we publish current, practical, in-depth books. It may take some of the larger publishers that Ruhl mentioned 18 months, but a small, aggressive specialty publisher moves much more quickly.

I hope Ruhl's article does not discourage aspiring authors. There are many benefits beyond immediate dollars. If any of your readers wants an honest assessment, they can contact me. We are looking for authors. In academia, they say, "Publish or perish." In professional publishing, I say, "Publish and prosper."

Edwin F. Kerr
Executive Vice-President and Publisher
QED Information Sciences
Wellesley, Mass.

Short-term focus

In your Feb. 12 editorial, you ask, "Why not push for laws that rein in the absurd leveraged buyouts and corporate raiding that have created a climate in which management increasingly focuses on the short-term view at the expense of long-term planning?" The answer is that such laws would only create further distortions in our economy.

LBOs and raiding are simply symptoms; they are the result of a tax policy that rewards debt and punishes equity and that taxes the earnings on long-term investment at the same high marginal rates as short-term. The solution is not new laws but reforms to the existing tax system that correct this inequity.

It does not surprise me when Congress bleats like sheep at the consequences of its policies. It disturbs me greatly when responsible journals join them.

William Hugh Murray
New Canaan, Conn.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.*

Escaping technology catch-22

MICHAEL GAUTHIER

The 1980s was supposed to be the decade in which information technologists entered the mainstream of business management. But the '80s have ended, and the gap between technical and nontechnical managers remains as wide as ever.

Why has the promise failed to materialize? Much of the fault lies with that most basic of business instincts: fear of failure. Managers on the business side steer clear of taking responsibility for information technology because they fear any association with the high costs and risks of system development efforts. This has set up a vicious cycle: Executives don't want to be involved in systems efforts because the efforts often fail, yet without executive leadership information systems efforts continue to fail. The end result: Technologists still rule technology investments.

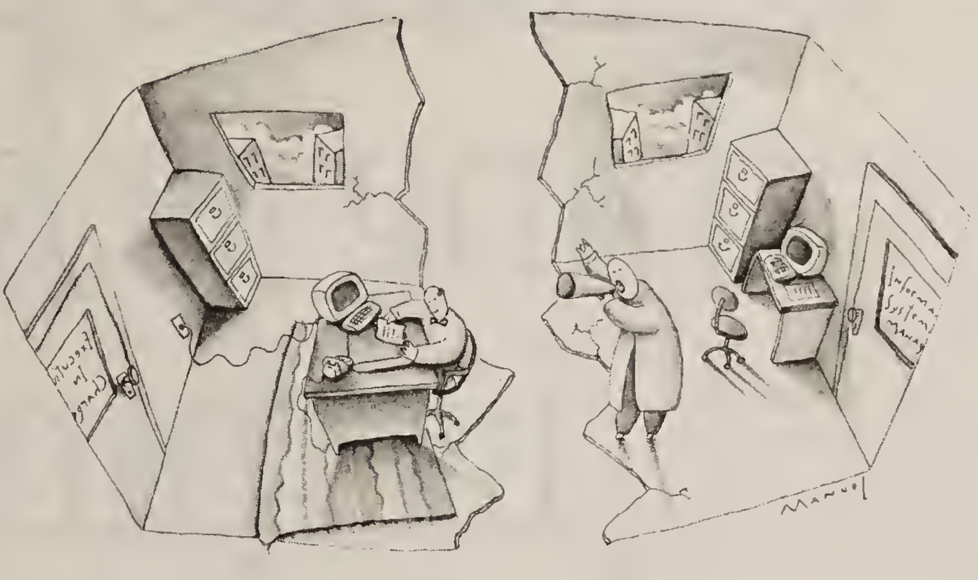
The position of chief information officer, which was heralded during the '80s as evidence of technology planning's entry into the executive suite, has in practice become yet another manifestation of the technical/nontechnical gap. Rather than being a true member of the senior management team, the CIO in many companies is an excuse for top management to remain at arm's length from technology planning.

What brought us to the current impasse? Inertia is to blame. In the '60s, '70s and on into the '80s, senior management, vendors such as IBM and technologists all took great pains to create an image of a monastic order — strange titles, arcane language, cloistered rooms — around IS. This image served an important purpose: It gave an identity to the highly specialized professionals required to operate early systems.

However, as technology moved out of the cloister and onto the desktop, much of the mystery and specialization evaporated. In many cases, what was left was a group of modern-day Wizards of Oz — technologists who hid behind a curtain of jargon and tried to remystify a skeptical audience.

This attitude will not survive the '90s. As the use of information technology becomes more and more central to competitive advantage, companies will have no choice but to close the chasm between the technology manager and the business manager. The costs of poorly designed and poorly managed systems efforts — slow responses to market change, inflexibility and wasted money — will simply be too much to bear.

Successful technical people will, like Oz, have to step out from behind the curtain and explain the truth: Users do have the ability to address many of their own needs if they have the training and the courage.



Manuel King

In short, technologists, users and senior managers will have to join forces to change their traditional roles and relationships. Technologists will need to live close to the action, helping users and management make day-to-day decisions on information technology investments from a business perspective. Users, in turn, will need to take over many of the implementation tasks, using tools created by their more technical brethren. Finally, senior managers will need to adjust to the rapidly blurring distinction between a user/implementer and a technologist/designer, creating, for example, new organizational structures to capitalize on the change.

Where will this leave the CIO? The CIO's traditional control orientation was a natural product of the "age of difference" that is now obsolete. It was an exceptional CIO who was willing to relinquish control over technology selection and implementation in favor of a role as a leader and standard-setter. But now that real control over technology is dissipating, a rear-guard action to delay or divert this natural evolution is a waste of time.

To succeed in the '90s, the CIO will need to take on a leadership role, actively identifying areas in which technology and technologists can add real value to the firm. Examples such as the following abound:

- Innovative research and development that can enable a company to leapfrog its competition through higher quality, lower costs or more efficient delivery.
- Educational programs for management and users that make them more effective.
- Development of possible technical or business scenarios for the future that will put useful management information in the hands of decision-makers.
- Forays into information management that bring the information industry into the corporation.

Progressive CIOs are already moving toward these roles and away from the traditional control-oriented jobs of technology selection, development, implementation and operation.

When technologists leave the cloister and enter the mainstream of business management, sweeping changes in the use of IS will be set in motion. But perhaps most noticeable of all will be the change in the vocabulary of a successful CIO. Phrases such as "revenue effect," "organizational impact of technology" and "access to knowledge" will replace the traditional acronym-laden vernacular.

Indeed, with any luck, nontechnical managers will take up the burden of arguing the bits and bytes while CIOs get on with the business of using technology to make money for the business.

Gauthier is a principal of Temple, Barker & Sloane, Inc., an international management consulting firm in Lexington, Mass.

Getting ANSI to take a leadership role

JOHN BERG

What ANSI crisis? Over the last few years, the American National Standards Institute has positioned itself as a transparent conduit for the flow of U.S. ideas coming from many disparate sources and intended for international information technology (IT) standardization.

Rather than exerting leadership over standards sources, ANSI chose to restrict itself to setting and monitoring rules that protect members from antitrust or anticompetition risks. ANSI's move to this passive administrative role could not have come at a worse time for the U.S.

U.S. information technology users and suppliers are experiencing an era of intense global competition and are watching with concern a new European common market glued together with centrally directed standards. They share a high, but frustrating, interest in the International Standards Organization's (ISO) Open Systems Interconnect.

Larry Eicher, secretary general of the ISO, warned participants at the recent International Symposium on Information Technology Standardization that the IT industry is one of a "new breed" of global industries challenging the current standardization processes and that "customers of IT products and systems are insisting" on compatibility.

U.S. information technology customers, shying away from proprietary systems, see ANSI as incapable of providing the U.S. with either a vision of the future or a road map to a needed infrastructure. Consider the evidence. IT suppliers have shifted their financial support away from ANSI for the promotion or development of standards. The multinational corporations have found many other national avenues to affect the outcome of ISO-level standardization. The result: ANSI's current financial crisis results from its inactivity, threatens its survival and limits ANSI's value as a useful tool for U.S. international competitiveness.

Standard demand

I recently coined a new word, "ultrastructure," to describe IT standards that anticipate or parallel the progress of information technology so that open systems and interoperability are built into new products. The public good may demand this just as it demanded standard threads on fire hydrants, standard railroad gauges and standard voltages. How can the U.S. describe and implement a common national IT objective without government intervention or without doing harm to the voluntary consensus process of standardization?

A former chairman of ANSI, L. John Rankine, suggested several organizational characteristics needed for proper representation of the U.S. views in ISO.

Currently, 60% of ANSI's standardization activity is comprised of information technology, and Rankine would like to see an IT industry sector council within ANSI that provides needed expertise to ANSI's management and sets objectives for the U.S.' IT infrastructure.

Most IT industry leaders would oppose establishing yet another standards body such as a Standards Council of the U.S.A. Rankine's ideas could revitalize ANSI by expanding its mission beyond its current self-imposed administrative scope so that ANSI would include strategic planning, leadership and financial direction.

Too much the diplomat to criticize frequently, Rankine nevertheless stated, "Information technology interests are poorly represented at the management level in both the national and international standardization structures." Improved IT industry representation in ANSI would also help solve a problem vastly more important than ANSI's survival.

Where once our nation's commerce rode on oceans and rivers, rails and highways, in the next decades commerce will ride on wires, microwaves and glass fibers. Important to U.S. competitiveness is an IT infrastructure equal or superior to one anywhere else in the world. Yet Japan, with 4% of our land area, annually spends on its IT infrastructure as much as we do. The European Community, which has roughly the same size common market, will be spending annually twice what we spend. The U.S. falls further behind each day.

We cannot afford the absence of a common objective directing our collective expenditures, nor can we afford petty squabbling among our information technology suppliers to dilute the competitive value of current user IT expenditures. If IT suppliers can choose where they will and won't compete, in organizations such as the Corporation for Open Systems and Open Software Foundation, why can't they use ANSI to meet with users, to create a common vision for the U.S. IT ultrastructure and to develop public standards that lead to cost-effective solutions for users and suppliers?

Berg is editor in chief of *Computer Standards & Interfaces* and serves on the planning committee of the International Conference on Standardization.

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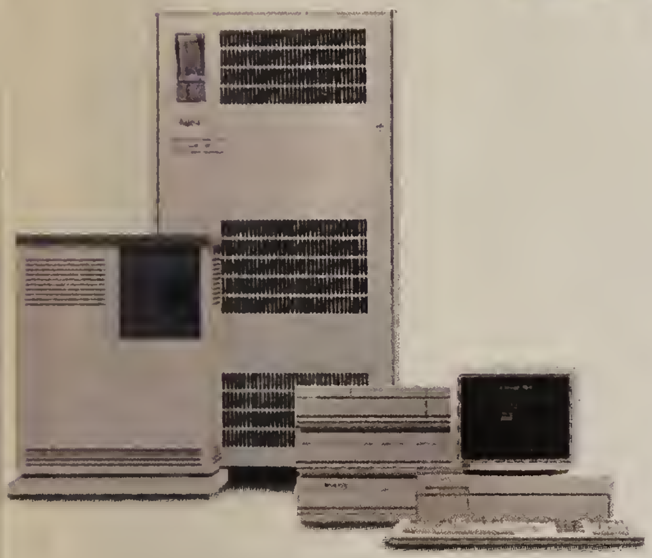

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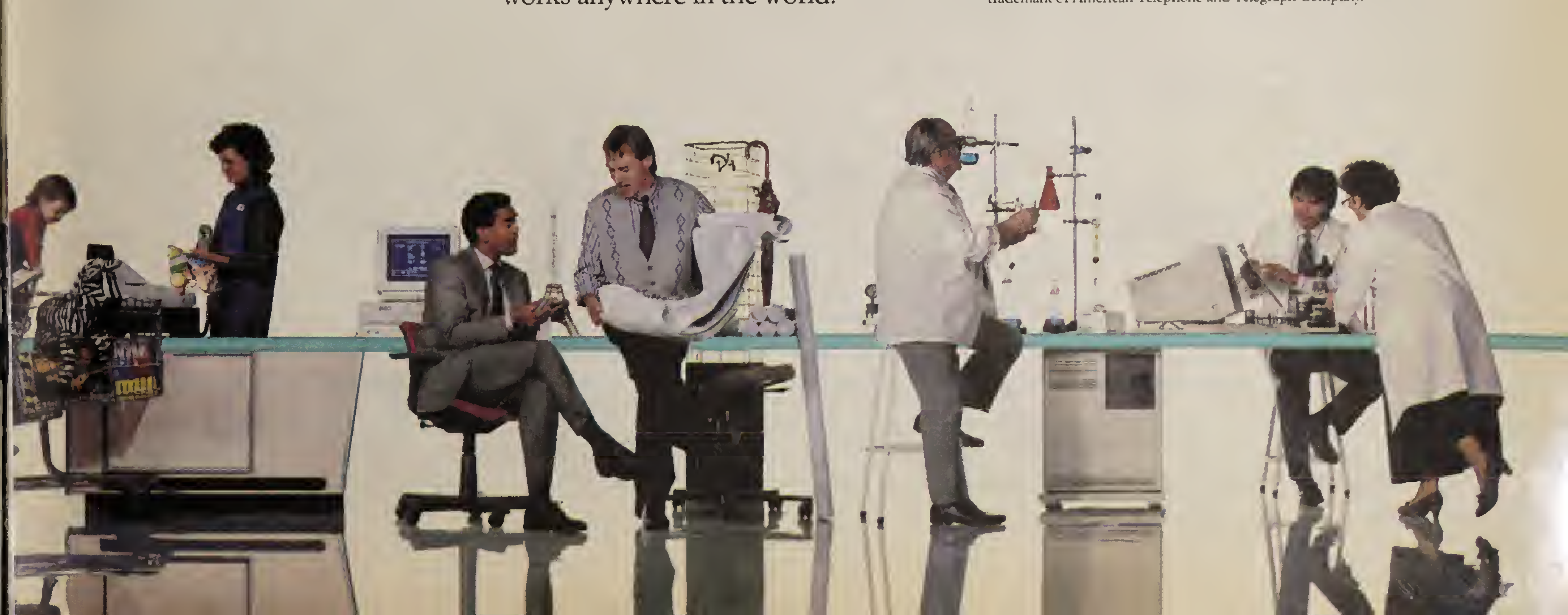

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SOFT TALK

Robert Moran

Self-interest and altruism

Three weeks ago, Drexel Burnham Lambert dumped approximately 300 information services employees onto Wall Street, a good many of them applications developers who had honed their craft over the years on the leading-edge applications that made the company a dominant player in the financial world of the 1980s.

Their skill sets include the ability to meld knowledge of the brokerage industry with applications building techniques tailored to some of the best systems in the industry. As a reward, recruiters say, they grossed about 20% more in their weekly paychecks than did their peers at other firms.

However, the same sources say that the benefits derived from fueling Drexel's growth during the boom years may not be offered by future employers, especially to those developers who are forced to snap up jobs in other industry sectors. In short, these developers may have to take a cut in pay.

Drexel's information services management doesn't agree with the recruiters. While most developers will find jobs with comparable salaries in the brokerage industry, they say, others have the acumen to adapt and add value to applications development in other industries.

Granted, there may well be a

Continued on page 28

The time is ripe for DEC drives

New generation of RA drives would bolster hold on mass-storage market

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

They cost too much. They are a bit sluggish. And they leave enough market gap for a host of competitors to thrive.

Yet hard disk drives from Digital Equipment Corp. still rake in nearly $1 billion in sales revenue annually and hold a comfortable 80% to 85% chunk of the "captive" disk market among DEC's customer base.

The reason? A combination of customer faith and FUD — fear, uncertainty and doubt. While third-party vendors may offer look-alike equipment at prices 20% to 30% lower than DEC, users fear that price savings today may be doubly lost in maintenance problems later on.

"Is this independent vendor going to be viable? Can he support my next generation of machines?" asked Mike Casey, director of storage research with Infocorp in Santa Clara, Calif. "These are the kinds of questions users ask themselves."

They also ask themselves about those lofty price tags. The price/performance of DEC "seems out of whack with the rest of the world," sighed one user at a Midwestern company. The customer, who declined to be named in print, said his firm recently worked through the theoretical exercise of adding another disk to a Vaxcluster.

"It turned out that about the cheapest way was to just buy another VAX and stick it on there," the user said, somewhat incredulously. "The price of processors has gotten so low, and their disks are disproportionately expensive."

However, Casey and other analysts who track the disk drive industry say there is nothing on the horizon now likely to tip that competitive balance between DEC and third-party storage vendors such as Emulex Corp., System Industries, Inc. and Trimarchi, Inc.

Marginal measures

"If DEC can maintain 80% market share selling at very good margins, trying to reclaim that 10% to 20% by knocking their prices down wouldn't be worth the trouble," Casey said.

There is something new on the horizon, however.

With all the hardware clanking out of DEC these days — the mainframe VAX, the new fault-tolerant machine and another generation of Unix-based workstations due out within weeks — the time is ripe for a new generation of mass storage to appear.

First shipped in August 1988, the RA 90 is DEC's top-of-the-line drive, a 1.2G-byte 9-in. disk. A number of RA family disks can be strung together in a DEC storage array to provide from 2.5G bytes to 9.5G bytes of capacity for large systems.

"I would expect to see another drive in the RA 90 series coming soon, with higher capacity, better price per megabyte and faster, too," said James Porter, president of Disk/Trend, Inc. in Mountain View, Calif. "That's

Continued on page 28

Parallel stripes

When Digital Equipment Corp.'s VAX 9000 mainframe ships this summer, its VMS 5.4 operating system will include storage enhancements.

"The VAX 9000 has much the same structure of storage as the other VAXs," said DEC product manager Peter Ross. Disk mirroring is handled from the existing Hierarchical Storage Controllers (HSC).

One enhancement that breaks new ground for DEC is disk striping, a technique enabling parallel execution of multiple data requests by spreading applications and data over several disk drives. The drawback of striping across arrays of disks, however, is additional overhead cost. "If you need 4G bytes of disk capacity, you have to buy 5G bytes," explained James Porter, president of Disk/Trend, Inc.

Also new with the mainframe will be the KDM70 disk and tape controller, a single-host controller that gives DEC devices local access to the VAX 9000 XMI bus at request rates up to 700 I/O requests per second.

The fault-tolerant VAXft 3000, unveiled last week, includes two new disk subsystems plus a new software product called host-based VMS Volume Shadowing. The shadowing feature duplicates all data written to disk onto up to three disk volumes. The "host-based" aspect means shadowing now can be distributed throughout a Vaxcluster independent of the HSC.

Livermore opts for BBN RISC system

BY ROSEMARY HAMILTON
CW STAFF

Lawrence Livermore National Laboratory recently agreed to plunk down $4.5 million for a reduced instruction set computing (RISC) parallel computer from BBN Advanced Computers, Inc., a subsidiary of Bolt Beranek and Newman, Inc.

BBN claims that its TC2000, which will eventually be powered by 126 processors, will be the most powerful single RISC system.

Lawrence Livermore said the system will be used as part of its $10 million project called the Massively Parallel Computing Initiative. This three-year research effort will examine how parallel processing can accommodate very high-speed computing requirements that have traditionally been handled by supercomputers.

The fully configured TC2000 will operate at 2.4 billion instructions per second, BBN said. Lawrence Livermore plans to load it with 2G bytes of memory and 17G bytes of disk storage. BBN will ship it to Livermore in two installments. It will deliver a 63-processor version this month, and double that number in December. BBN introduced the TC2000 in July 1989.

Inside

- Interstate Bakeries has an unusual recipe cooking. Page 25.
- Early Parity users wax enthusiastic. Page 25.
- Aiming for a clear picture of AIDS crisis. Page 29.

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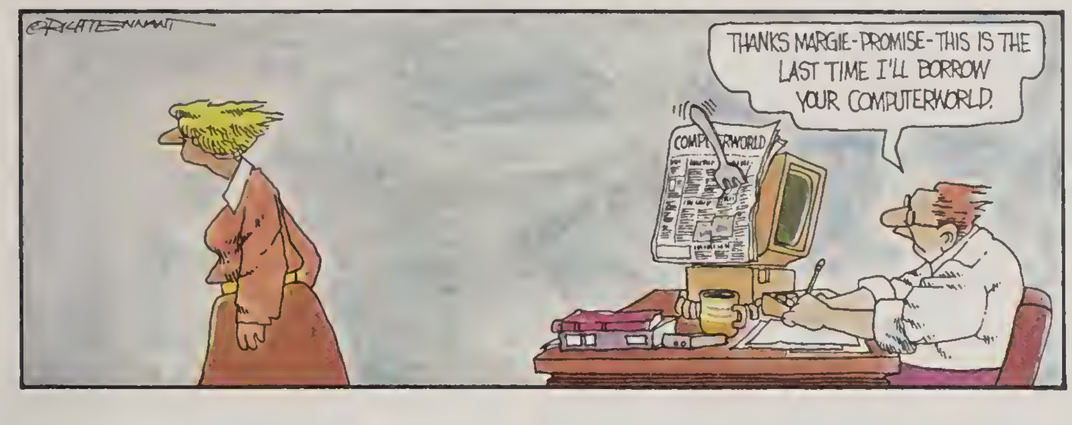

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Interstate's IS team takes on challenge

ON SITE

BY ROSEMARY HAMILTON
CW STAFF

It is a challenge for any information systems department to simultaneously manage a downsizing project and integrate a mix of equipment out in the field.

However, it can get pretty hairy when management tells IS to do it all with a minimum of disruption. Just ask the IS group at Interstate Bakeries Corp. in Kansas City, Mo.

Since 1987, Interstate has gone through the financial turbulence of a leveraged buyout, a major acquisition and a financial comeback of $1 billion in sales last year. It is no wonder, then, that management wants some quiet time.

However, for IS, that means the easiest technical challenge — standardizing on one hardware platform — had to be overruled in favor of somehow connecting its two incompatible environments and an assortment of other equipment.

With the acquisition of the Merita division of the American Baking Co., Interstate's IS group found itself overseeing its own Hewlett-Packard Co. minicomputers and Merita's Bull H. N. Information Systems, Inc. systems as well as small IBM mainframes for corporate processing and a stand-alone Prime Computer, Inc. minicomputer.

Meanwhile, a downsizing program initiated five years ago that would one day do away with the IBM mainframes still has to be completed.

Do not disturb

"It was more important to minimize the disruption than to make it easier on us technically," said Mike Holdgraf, vice-president of IS.

As a result, Holdgraf and his staff have spent months working on a way to link the HP and Bull equipment.

"The biggest problem that we've been wrestling with is how do we avoid having users with two terminals on their desks?" Holdgraf said. "You'd need that with the way it's set up."

Linda Bleck

According to Holdgraf, Interstate had a choice: Either go with a networking scheme from one of the vendors that would patch together the two environments or wait until the vendors could offer networks that supported a fully completed Open Systems Interconnect (OSI) suite of standards.

The drawback with the first choice was that it seemed too proprietary, according to Holdgraf. Once this network was in place, Interstate would essentially have been locked into a system and locked out of any advances made in open networking.

IS went with the second option, but it has its drawbacks, too. While Interstate waits for its vendors to offer complete OSI-based networks, it must live with limited networking functions and must often rely on the old-fashioned way of doing things — "Sneakernet."

Currently, users can access either environment via a personal computer and download data. But there are no higher level networking functions, such as file transfer. So when IS needs to transfer files from an accounting application on the HP system to an accounting package on the Bull system, it must transfer the data from disk to tape, then carry the tape from one system to the other.

At the time of the Merita acquisition, IS considered moving it to the HP platform. Merita was running on 10-year-old Honeywell Bull, Inc. systems, now belonging to Bull H. N., and it was ready for an upgrade. Because its systems were so old, even a move within the Bull product line would have required some conversion to the latest operating system release.

But then the concept of minimal disruption reared its head.

According to Holdgraf, the Merita division was running a highly efficient order processing system on its Honeywell equipment that was better than Interstate's system, and Merita did not want to give it up. Furthermore, when Holdgraf's staff reviewed the options for Merita, it determined that the effort "it would have taken to convert [to HP] would have been a Herculean task," Holdgraf said.

"It would have subjected them to a very serious disruption," he added. "From a performance and price perspective, the two systems were nearly comparable. But in terms of conversion, we felt [that staying with Bull] would be a much less disruptive move."

Easy as pie

Compared with the networking project, the downsizing effort is almost a proverbial piece of cake. The project involves replacing IBM 4361-based applications at headquarters with applications on HP systems out in the field. Holdgraf said this project has continued through the acquisition and should be completed soon. Only two applications — general ledger and accounts payable — remain at headquarters.

Holdgraf said he is hoping the 4361 will be gone in two years. An HP minicomputer will remain at headquarters to oversee the distributed environment as well as the accounting applications for the corporate development and program development for systems in the field.

Meanwhile, the Merita division, which handled applications centrally on a small IBM mainframe, will also be downsized. Interstate will be loading accounting applications on the Bull minicomputers in the field starting in September. Holdgraf said he expects this project to be completed in two years.

Parity lends a DB2 helping hand

BY ROBERT MORAN
CW STAFF

Early users of the Parity Database Management Support System said that the software refines and speeds up the DB2 development process.

The software, from Paragon Software International in Bogota, N.J., is an integrated set of on-line development commands and performance analysis reports designed around a proprietary artificial intelligence system.

Parity DBSS, as it is known, allows even inexpert developers to create highly optimized SQL code by guiding them through the building, editing, syntax checking, analysis, testing and maintenance of embedded or dynamic SQL, the firm said.

According to two users interviewed recently, only a few similar products are available on the market, and Parity DBSS is much more comprehensive. The software costs between \$32,000 and \$50,000 per CPU license, depending on the size of the CPU.

Beta-test site user Anthony Catania, vice-president of funds transfer systems at Manufacturers Hanover Trust in New York, has been using Parity DBSS since June 1989. According to Catania, the mainframe-resident software has garnered the company a 20% productivity increase in DB2 SQL development. "We decreased our development time, primarily because there were fewer coding errors and fewer compiles," he said.

Raj Dawar, senior database administrator at Shearson Lehman Hutton, Inc. in New York, has been evaluating Parity DBSS since December 1989. Dawar said the software is rich in functionality, especially the SQL syntax checker and its ability to check the efficiency of the SQL code.

"Overall, the software will increase our productivity and cut down the turnaround time in development," he said.

According to Paragon, Parity DBSS command can be entered within an IBM ISPF edit session, which allows editors, for example, to code, check the syntax and run inquiries without leaving the session. In the normal cycle, designers code, compile, unit test, debug, recompile and unit test again, Catania said.

"There is very little learning curve with DBSS," Catania said, "because it runs within the ISPF session, allowing developers to learn very quickly."

Parity DBSS also offers organizations four guides: a plan that analyzes SQL statements and host variables; a report on DB2 tables including related objects, referential constraints and space utilization; a report on authorizations, dependencies and capabilities of the plan; and an interactive aid for fine-tuning DB2 applications.

"We use the reports for walkthroughs with the project team and standardize the way our SQL looks throughout the application," Catania said. "As a result, the reports help communications with database administrators."

Catania said that Parity DBSS is also an educational tool that promotes good standardized SQL coding: "People with very little knowledge, with time and use, become more informed about DB2."

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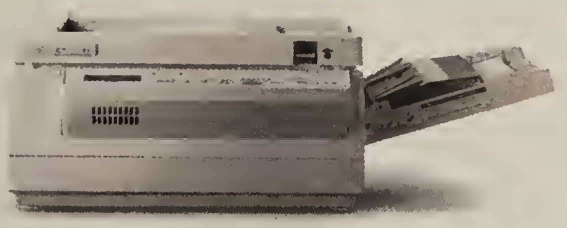

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DEC

CONTINUED FROM PAGE 23

the obvious direction for DEC to go."

Obvious directions are precisely where customers like to see disk drives headed. Revolutionary changes mean years of delay and massive migration headaches, the analysts pointed out.

Ever since IBM built the first mainframe disk drives, DEC has technically lagged behind the computer giant. IBM's drives have always been faster, more powerful and, incredibly enough, cheaper as well.

"Disk drives are just one area where DEC has not had the ability to compete advantageously with IBM," Porter said. This is one of the key reasons DEC never had a significant presence in the glass-walled world of mainframe computing, he added.

"Disk drives are such a large part of the cost of any mainframe site; it's typically 25% to 40% of the total site cost," Porter explained. "So you're dealing with a very sensitive parameter."

Another sensitive area has been the stormy and litigious relationship between DEC and independent disk drive vendors.

"DEC did a lot of arm-waving in the past, but the lawsuits and patent infringements have calmed down," said Bob Abraham, vice-president of Freeman Associates, Inc., a market research firm in Santa Barbara, Calif. "I think the industry understands where the boundaries are."

DEC is also in a stronger competitive position these days, analysts said, with its price per megabyte heading down the cost curve and its internal production of high-end drives broader in range and capabilities.

EVER SINCE IBM built the first mainframe disk drives, DEC has technically lagged behind the computer giant.

Ironically, the presence of cheaper third-party equipment can actually make a systems package more affordable to certain end users — an option not lost on a DEC salesman anxious to make his quota.

While DEC has not suffered through the technical glitches that plagued IBM's 3380 disk drives, the minicomputer maker is notorious for tardiness in getting its high-end drives out the door, analysts said. The RA 80, 82 and 90 were all later to market than promised.

However, Porter cautioned that "flippant criticism" of late deliveries is unfair because of the enormous complexity involved in manufacturing disk drives.

"They are a weird combination of mechanical and chemical engineering, physics and electronics," he pointed out. "A semiconductor doesn't have to spin at 4,000 rpm and last for 10 years."

Moran

CONTINUED FROM PAGE 23

learning curve, but it need not be a long one. Let's hope the value of these men and women is perceived as such, especially in a decade that will purportedly demand that developers take on the role of business analyst.

Drexel's IS management deserves some credit. Without funds for outplacement services, they arranged for job fairs at other brokerage houses and used their industry knowledge and contacts to match employees with openings.

THE WEEK AFTER the ax fell, about 200 IS employees kept the division running as Drexel continued trading off its holdings.

However, management, charged with selling off millions of dollars in software, is leveraging discount prices to find development team positions with the software's buyers.

This smacks of good old American ingenuity and favors self-interest in that old philosophical argument against altruism.

Meanwhile, the week after the ax fell, about 200 IS employees kept the division running as Drexel continued trading off its holdings. Over a weekend, Drexel transferred its securities accounts to Shearson Lehman Hutton and its mortgage applications to Goldman, Sachs. Each transfer required the development of 50 or more programs that would ordinarily have taken months.

According to one IS executive, the Drexel story had a curious twist — a network failed after Drexel fired its employees, but it was able to locate a bunch of its network people at "a local establishment" (a bar) to come back and help.

According to the source, some of the former employees charged a consultancy fee, but others worked without pay.

During the week, Drexel had a similar problem — a systems failure that was eventually solved by former employees, some charging a consultancy fee and others working gratis.

Such a scenario makes me wonder again about self-interest and altruism.

Moran is *Computerworld's* senior editor, software.

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Software to give cities a hand in their fight against AIDS

BY WILLIAM BRANDEL
SPECIAL TO CW

While federal efforts to combat the spread of acquired immune deficiency syndrome have focused mainly on the largest U.S. cities, smaller communities struggling with the problem need assistance as well.

The belt-tightening in Washington, D.C., may squeeze out these smaller cities, but a software application that models the disease's proliferation may at least give them an idea of what they are up against.

The National Institutes of Health are financing the University of Minnesota's effort to build a model of the effects of epidemic diseases in midsize U.S. cities. The model is now running on a Digital Equipment Corp. Microvax 3100.

The program's present thrust is to provide government, insurance and health officials with statistical projections of how many of their community's drug users will contract AIDS, how soon this will occur and what the expected mortality rate will be.

"The idea is to give smaller cities that do not receive [the same attention as] the larger cities an idea of how the disease spreads and who gets it," said Michael Altman, one of the university researchers.

The advantage in this is not only the savings realized by sharing data with other cities and avoiding redundancy of staff efforts. The program's output can be put to further use. Insurance companies can be given a working statistical model; health officials can see a clear picture of the magnitude of the disease; and public officials can have a sound basis on which to determine financial need.

Called the Simulation Resource for Scholastic Micropopulation Models, the software will initially track AIDS transmitted by hypodermic needles. But the software will eventually be used to determine the spread of other epidemic diseases such as influenza.

In addition, the university researchers are now incorporating elements of artificial intelligence and neural network technology. This will allow users of the software to input new AIDS- or drug-related data, and the model will then reflect these changes without requiring extensive reprogramming.

While the software takes into account some of the dynamics of AIDS, its emphasis is on community and social interaction, not the disease itself, Altman said.

"Research already tells us what the disease will do; this shows us how fast it will spread," he said.

To expedite development efforts, the university has moved development of the system from a DEC VAX-11/750 to a Microvax 3100 running Decwindows. Altman said the conversion from the VAX-11/750 to a Microvax 2000 and then to the Microvax 3100 was virtually flawless.

The programming team is also finding Decwindows effective for both high-level and standard programming, but its introduction to the X Window System-based system was not quite as smooth.

One of the first problems arose when using the Decwindows calendar. After it was filled with data, "it started to self-destruct, eating up the whole calendar," Altman said. Development was impeded by repairs, and then a lot of time was devoted for the researchers to learn the Decwindows system, he said. "We definitely found its limitations very soon."

The Microvax 3100 has proven itself quite adequate for handling a software burden that includes Decwindows plus 20 applications. Although Altman is in the final, and most tedious, stages of writing code, he said he is still enjoying a 10% cut in development time. "I can look at code in one window and run the debugger in another," he said. "If I hit a glitch, I just point and click and watch the output of new code in the other window, or pop off an E-mail message in another window."

However, the system is cost-effective and the applications have rendered accurate results, Altman said.

SOFT NOTES

Andersen gets reasoning tool

Andersen Consulting recently signed an agreement with **Inference Corp.** to use that firm's Automated Reasoning Tool expert system development software. Andersen will be able to use the Inference tools internally as well as in its systems integration business. According to the agreement, Inference will provide consulting services to Andersen clients.

Candle Corp. is one of the software firms now embracing the idea of leasing software as an alternative to purchasing. Through an agreement with **Meridian Software Funding, Inc.**, Candle will offer a leasing option for its data center management software packages.

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Somerset, NJ	Apr. 17	Windsor Locks, Ct.	Sep. 11
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San Francisco, Ca.	Aug. 1, 2	Chicago, Il.	Oct. 23, 24

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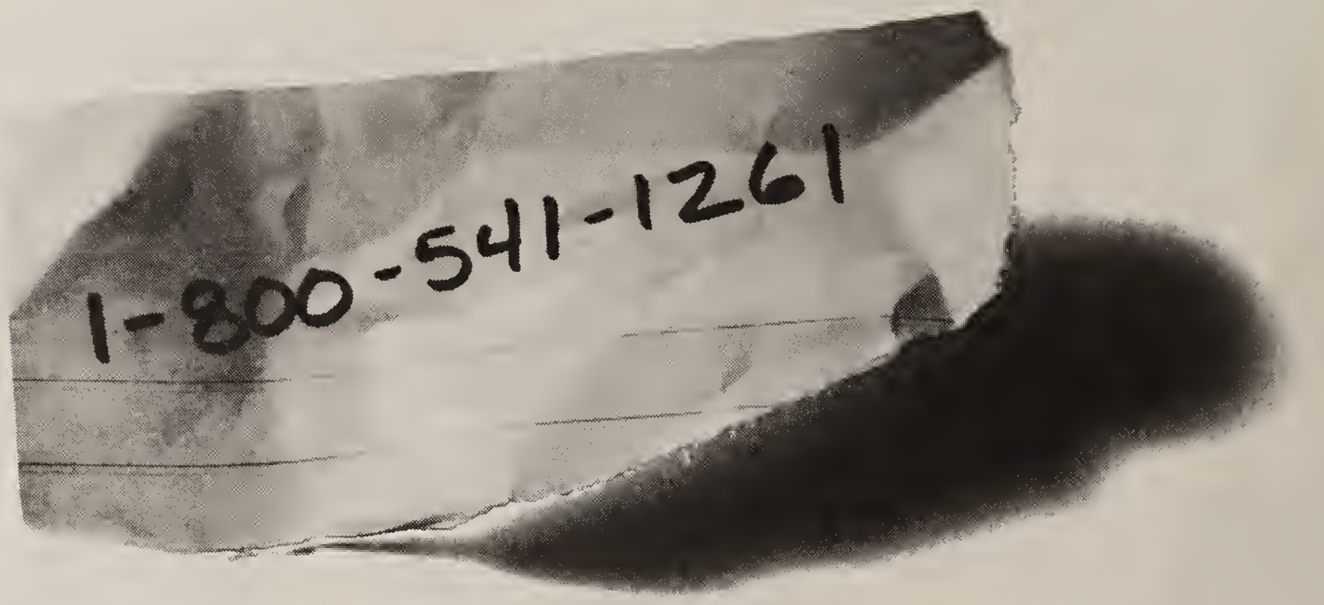

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PCs & WORKSTATIONS

MICRO BITS

Patricia Keefe

Users of the world, unite!

If you've been paying any attention at all to high-technology stocks over the last few quarters, it should be patently clear that there's a slowdown going on.

One of the hardest hit companies seems to be that behemoth that many love and fear so much — Big Blue. Surely you've seen press clips elucidating the end of the "job for life" tradition at IBM. But it does not suffer alone. We now have DEC facing the likelihood of its first-ever layoffs. And Apple Computer has already announced plans to cut 400. So what's the point? Just that IBM, along with many U.S. computer suppliers, has never needed you like it needs you now.

Sure, all these firms are both looking to Europe and dreaming about expansion into Eastern Europe as the road to high growth. But even putting nationalism aside, unfriendly exchange rates on the one hand and a lack of hard currency on the other, make for a hard row to hoe.

No, the way I see it, now is the perfect opportunity for U.S. users to quash boorish and bul-

Continued on page 44

Font venture may help buyers

ANALYSIS

BY CHARLES VON SIMSON
CW STAFF

Despite all the talk about confusion in the outline font segment of the personal computer business, the situation for end users is remarkably clear.

If Microsoft Corp. and Apple Computer, Inc. can make good on their promise to make their Royal outline font completely compatible with Adobe Systems, Inc.'s Postscript standard, then users will benefit as both sides move toward a single screen and printer font standard across Macintosh and Intel Corp. hardware platforms.

However, if Microsoft and Apple fail to deliver, and instead produce a competitive technical standard not sufficiently compatible with Postscript, the goal of having a single font standard will be delayed for at least several product generations.

One potential fly in the ointment now is Hewlett-Packard Co., which is not only the leading laser printer supplier, but also appears to be pushing its own fonts while refusing to commit to the Royal outline.

David Flaherty

"If Apple and Microsoft can make Royal a superset of Adobe, then it will help the user," said Marshall Mosely, a software analyst at Dataquest, Inc. "The market incentives suggest they will do it. If they do not, it is hard to see where anyone, including the vendors, will benefit."

Analysts and developers under nondisclosure said they have seen prototypes of the Postscript-compatible Royal fonts running under OS/2 Version 2.0, which is scheduled for release in the second half of 1990. Release 2.0 is likely to be the first Microsoft product to contain the fonts and will be an important litmus test of their compatibility.

As it stands today, users cannot move formatted information and graphics from computer to computer or send the information to any output device unless all the machines involved are using exactly the same font technology, including font drivers.

With a single standard, screen images and printed documents could move unchanged among machines and ultimately between Intel-based PCs and Apple Macintosh systems.

Microsoft and Apple announced last September that they would produce a cross-licensed common outline font

Continued on page 44

Lotus adds Dbase III interface to Symphony

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Symphony, Lotus Development Corp.'s integrated desktop package, will get a needed boost from the features in the recently unveiled Version 2.2. Most notable is the incorporation of support for Personics Corp.'s @Base add-in to provide a Lotus-style interface to Ashton-Tate Corp.'s Dbase III.

The @Base environment lets users access, modify, create and manage Dbase III files from within Symphony. "[@Base lets you] have database data located out on the hard disk, as opposed to in memory, enabling you to only deal with single or selected records. It saves a lot of RAM," said Doug Stoner, a project leader for the Information Technology Group at Texaco Chemical Co. and a Symphony 2.2 beta-test user.

Other new Symphony attributes include file linking between Symphony and 1-2-3 Release 2.01 and 2.2 files; incorporating Lotus' Magellan viewer technology for fast file previewing, retrieving and linking; improved support for expanded memory; better integration of the Allways publishing technology; simplified macro debugging; and additional printer and display drivers.

Analysts were somewhat blase about the announcement, suggesting that integrated packages have seen their day. However, Symphony currently has about one million users worldwide, and users such as Stoner do not foresee switching over to standalone applications such as 1-2-3. "1-2-3's 3-D capability has nothing on Symphony," he said.

File linking allows users to link a cell in an active worksheet in memory to cells in worksheet files on disk, making it easier to build and maintain applications that use the same data. Linking can be done automatically.

The Magellan viewer capability speeds up file linking by allowing users to immediately see the data needed and to create a link with a single keystroke, said Danny Erdeljac, a senior design engineer at Dow Chemical Co.

Advanced support for expanded memory supports bigger spreadsheets and applications. Users who previously exhausted conventional memory before the limit of their expanded memory will now gain up to 4M bytes of expanded memory, Lotus said.

The debugging facility displays the command as the macro is executed so that users can easily locate and correct bugs.

Available this quarter, Symphony 2.2 costs $695. Registered users of earlier versions can upgrade for $150.

Inside

- Pier 1's inventory system tames the exotic. Page 37.
- Believing the hype can be RISC-y business. Page 37.

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Pier 1 pursuing shipshape shelves

ON SITE

BY RICHARD PASTORE
CW STAFF

FORT WORTH, Texas — It takes months of dickering, careful translating and political string-pulling to get a shipment of wicker ottomans out of Bombay. That is one reason why Pier 1 Imports, Inc., which buys 85% of its merchandise from such exotic, relatively inaccessible ports, needs a state-of-the-art inventory management system.

"We can't just reorder merchandise like that in two or three days like most retailers. It takes months to get this stuff from overseas," said Harold Muller Jr., vice-president of Pier 1's information services division.

Consequently, merchandise shortages and item overstock — both deadly to the bottom line — are constant hazards at this furnishings and clothing retailer. But Pier 1 is looking for help from an inventory management system that could aid buyers in determining when and how much merchandise to import.

Such an application is being installed on the firm's personal computer-based point-of-sale (POS) system from International Computer Ltd. (ICL).

The IBM-compatible PCs, located in the chain's 5,000 stores and distribution centers, will be linked to an IBM 3090 Model 150S mainframe at headquarters via dedicated fiber-optic lines.

When the system is up and running in July, the PCs will communicate in real time with the mainframe, updating the master inventory file and alerting distribution centers to ship specific merchandise to stores.

In turn, the mainframe-based portion of the application will analyze sales statistics and forecast demand, alerting Pier 1 buyers when to call on suppliers in India, China, Japan and other countries.

Pier 1 currently leaves inventory control in the hands of each store manager. Headquarters produces an inventory-availability report, from which store managers can order stock based on what is selling. But that system is becoming impractical in light of Pier 1's growth. The chain has doubled in size in the last four years and plans to double again by 1993 (see story at right). Its active SKUs, or retail items, have ballooned to 7,000.

"It's become impossible for the store manager to manage inventory effectively," said Muller, whose staff of 75 serves about 1,100 users nationwide.

Besides taking some of the burden away from managers, the system will also relieve them of some of their independence.

"We're taking price-change management out of their hands," Muller noted. Currently, store managers are at liberty to reject price reductions set by headquarters. Indeed, most of the time, managers ignore the price change in order to keep their own margins high, Muller said. "This slowed sales and backed up inventory at the distribution centers," he explained.

With the new system, when a sales clerk punches in an item's code, the PC will access the host for the corporate price and ring it up automatically. Such regimentation will also help prevent fraud at the store level, Muller noted.

Pier 1 is already leveraging its 3-year-old ICL POS installation, which currently uploads sales data and electronic mail to the host on a nightly batch basis. The mainframe plots POS-supplied customer ZIP code and purchasing data on geographic charts. By analyzing this data, the company can tell what locations would be the best candidates for new stores. It can also determine the types of merchandise that sell best in different demographic regions. All this adds up to a more carefully targeted consumer market.

Muller said he expects the system to affect the bottom line in 12 to 18 months: "It will reduce inventory levels at the stores and warehouses, which will reduce our overhead."

Stan Wolenski

Muller *believes Pier 1's inventory management system is key*

Tides of change

Over the last four years, Pier 1 Imports, Inc. has evolved from a relatively mom-and-pop operation to big business, more than doubling its sales to $520 million and its stores to 580 in the process, said Harold Muller Jr., vice-president of IS.

To fuel that growth, Muller had to abruptly replace 1960s-era systems with 1990s technology while also coping with corporate culture shock.

"We encountered some resistance in the financial area, where people were concerned about their jobs," Muller recalled.

While replacing homegrown finance applications with shrink-wrapped packages and automating or eliminating manual tasks, Muller steadied the finance staff "through constant hand-holding. Today these people think we hung the sun. They even send me Christmas cards."

Muller now encounters resistance to change in the merchandise area.

Muller said he will try to resolve the difficulties through a business-systems liaison group, which acts as an interface between his IS management and the business users.

The group is made up of users recruited from other retailers. For instance, the liaison between the financial area and the financial programmers is a certified public accountant from another retail organization.

Muller said it is more practical to hire liaisons rather than look for systems professionals with retail business experience.

RICHARD PASTORE

Managers find RISC not worth the gamble

BY WILLIAM BRANDEL
SPECIAL TO CW

The thunderous fanfare that preceded reduced instruction set computing (RISC) systems has lulled as the benchmarks are filed and the packing boxes opened. Information systems managers are trying to integrate these quick systems into their corporate strategies, but questions about companywide viability arise rapidly as users chip away at the RISC myth.

Summa 4, a telephone charging system developer in Manchester, N.H., is currently evaluating a Sun Microsystems, Inc. Sparcstation 1 to replace its Digital Equipment Corp. VAX 11/780. Mark Pubinis, vice-president of engineering, must define his new system strategy in the coming months and said he finds a modular workstation approach appealing. But he has found that while the RISC processor churns data quickly because of its design, it also carries some baggage.

Because the instruction sets are smaller, they must be run more often to execute a program, Pubinis said. This means using more register sets in memory and sending more data to and from storage, "which causes I/O bottlenecks."

This is not just the Sparcstation's problem, Pubinis said. "This is the problem with RISC, and I have a real problem with that. I want to take advantage of a 13-MIPS machine, and right now I cannot. The verdict is out on whether we'll make the switch."

Aside from bottlenecks, hardware is the least of a RISC user's worries. "System vendors have done a very, very bad job of providing solutions for handling pricing, trade models, portfolio management, back-office management, control and general ledger applications," said Kevin

Continued on page 41

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"So, Horvath, what you're saying is graphical word processing is imperative to the future of this corporation. Well?"

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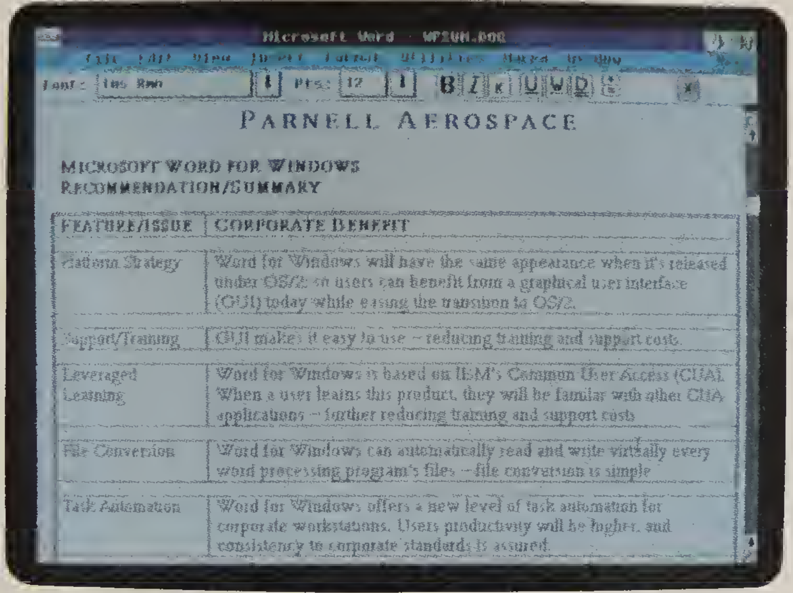
HORVATH: Well, Mr. Parnell... I think now's the time to make the change...
PITZER: Sure, that's what Cundy said about our database program two years ago. And we *all* know what happened to...
PARNELL: Pitzer, let Horvath finish.
HORVATH: Based on my comprehensive evaluation, I'm convinced that Word for Windows is the answer.
PARNELL: Word for *who?*
HORVATH: Windows, from Microsoft.
HAMILTON: Frankly, Ivan, I don't see why we have to change at all.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MICROSOFT WORD FOR WINDOWS
RECOMMENDATION/SUMMARY

FEATURE/ISSUE	CORPORATE BENEFIT
Platform Strategy	Word for Windows will have the same appearance when it's released under OS/2, so users can benefit from a graphical user interface (GUI) today while easing the transition to OS/2.
Support/Training	GUI makes it easy to use – reducing training and support costs.
Leveraged Learning	Word for Windows is based on IBM's Common User Access (CUA). When a user learns this product, they will be familiar with other CUA applications – further reducing training and support costs.
File Conversion	Word for Windows can automatically read and write virtually every word processing program's files – file conversion is simple.
Task Automation	Word for Windows offers a new level of task automation for corporate workstations. Users productivity will be higher, and consistency to corporate standards is assured.

Word for Windows' graphical user interface benefits people who've never even seen a boardroom. As well as those who frequent it.

HORVATH: You're missing the point. Graphical computing will soon be the standard. If we adopt the Windows platform now, all of our users benefit. Heavy users would spend hours on projects instead of days. And light users, minutes instead of hours. The way it stands, we're throwing away a whole lot of money. Not to mention productivity.
HAMILTON: But what about that OS/2 business everyone's been talking about?
HORVATH: What about it?... The interface will be virtually the same on Windows and Presentation Manager.
FIDLER: C'mon Horvath... that's a little hard to believe.
HORVATH: Not really... you see, Word for Windows is based on IBM's Common User Access. Once our users learn it, they'll be well on their way to understanding other applications that support CUA.
FIDLER: That's all *very* nice, Ivan, but let's go beyond long-term benefits...
HORVATH: Okay, Fidler. Consider how long it takes to develop a standard contract...
FIDLER: Yeah, what about it?
HORVATH: Using Word for Windows would eliminate the problem. Its Document Template feature can prompt users to input necessary data... So even our paralegals could write contracts.
DELMAN: Just a minute, Mr. Parnell, who's gonna provide the training?... It may be my job, but I haven't got time for it!
HORVATH: Relax, Delman... Word for Windows has computer-based training and context-sensitive, on-line help. So it's virtually foolproof... users can train themselves. Which means our training and support costs would be reduced and the corporation saves money.
COHEN: But what about the equity we have in our current system? Are you suggesting we trash it?
HORVATH: Not at all... Word for Windows has complete file conversion facilities...
COHEN: Complete?... *How* complete?
HORVATH: It'll read *and* write to virtually every word processing program.
PARNELL: So let me get this straight, Ivan... you're saying that Word for Windows is easier to use and allows people to do more things?
HORVATH: Precisely.
PARNELL: Which could only improve our productivity...
HORVATH: I rest my case, Mr. Parnell.
PARNELL: Most impressive, Ivan. But before I make my decision, I'd like to hear what Cameron thinks. Cameron?... *Cameron?*
LUCERO: Psssst... *Hey, Cameron, wake up!*

The preceding scenario has been a dramatization. The benefits of Word for Windows, however, are a reality. For further proof of its capabilities, simply call us for a free brochure. Or order our fully-functional Working Model for just $9.95.* The number is (800) 541-1261, ask for the folks in Dept. K56.

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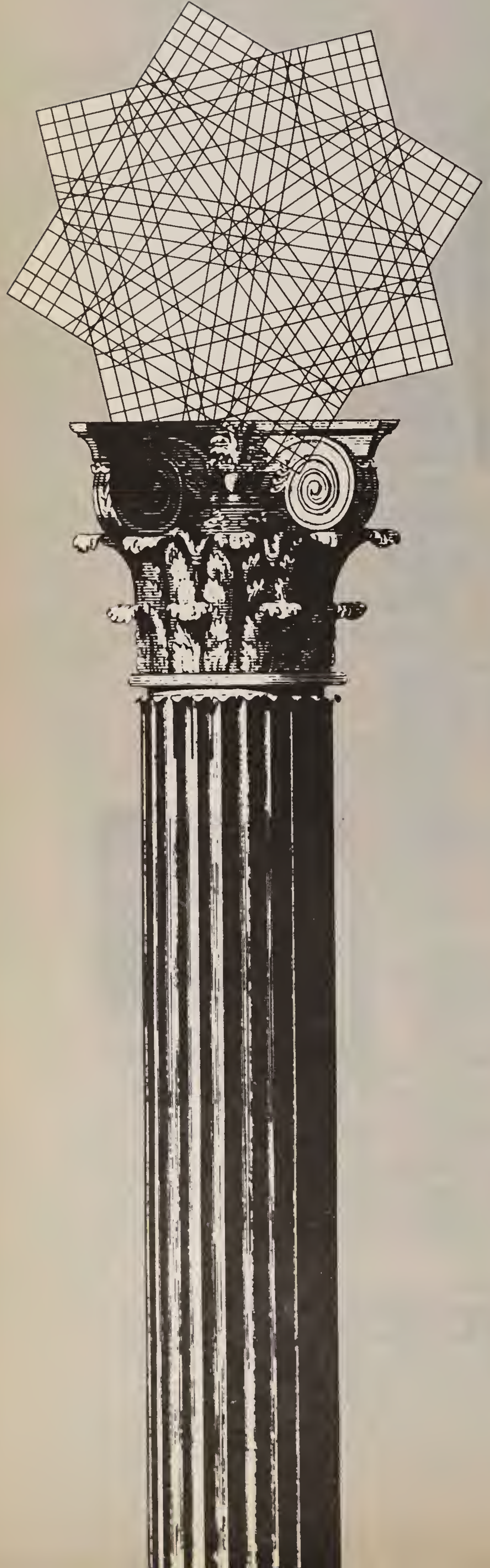

Recipients of the Computerworld Smithsonian Awards are people of vision and commitment who have used the tools of information technology to create positive change.

They create products which save lives, stop prison over-crowding, decrease famine, enhance human creativity and help the handicapped help themselves. If your flight is on time; if your children are doing better in school; if your home was not flooded during a serious storm; or if your missing child has been found, it is very possible that you have these people to thank.

Before the inception of the Computerworld Smithsonian Awards Program in 1989, few of these truly heroic individuals received the recognition they deserved. And, even though their achievements depend uniquely on computer technology, the technology industry did not receive the recognition it deserves for making this progress possible.

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***Education** — Orangeburg School District 5, Orangeburg, South Carolina*

Computers have dramatically raised test scores and reduced the drop out rate in an 80% non-white, 70% free-lunch school district.

***Environment, Energy and Agriculture** — Passaic River Basin Early Flood Warning System, Sierra-Misco, Inc.*

A network of microcomputers serves as an early warning system that saves lives and property.

***Finance, Insurance and Real Estate** — FIX and FAST Fidelity Investments*

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***Government** — The Missing Children Project, University of Illinois*

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***Transportation** — American Airlines SABRE Reservation Service*

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RISC

CONTINUED FROM PAGE 37

Sculley, vice-president of IS at Sumitomo Bank Capital Markets in New York.

For Sculley, who is starting a trading system from scratch, money and technology were not issues. That is, until he discovered that he could not buy any of the software packages he needed.

Ironically, Sculley turned to RISC after disregarding personal computers because of the lack of OS/2 applications. "Because of this, we have to develop our own and base our total development effort on X-11, OSF/Motif," Sculley said.

After a "hard evaluation" he chose DEC over Sun for its "philosophical software direction and its commitment to OSF."

However, open standards minus application choice equals vendor lock-in. Empire Systems, a hospital based in Seattle, knows this all too well. Empire has purchased Data General Corp.'s RISC-based Aviion system to support an integrated hospital administration package from Meditech, Inc. in Cambridge, Mass.

However, this does not make Craig Nielsen, Empire's IS director, any fan of DG or of RISC.

"If this package ran on an XYZ chip, I [still] would have bought it," Nielsen said. "Unfortunately, Meditech runs on DG, and if I want to use this system, so do I."

Although Nielsen does see "the danger of being locked into one vendor," he does not buy into DG's or any other Motorola, Inc. 88000 RISC-based vendors' notions of a binary-compatible standard.

"The entire idea of the [binary-compatible standard] means different software will be compatible only after it has gone through multiple interpretation layers," he said. "It takes away any benefits you would gain from RISC. It's no different than another module or emulator. It degrades the system."

Nielsen attacked the RISC market's Achilles' heel — software. Vendors are pushing hard to sell their systems on the strength of independent software vendor support. To differentiate from standard Unix software, RISC-specific applications must be rewritten to exploit the processor at the assembler level.

This is an unpopular concept with software developers as it not only locks the software to that specific processor but also provides only a 10% to 15% performance gain as well, said Chris Anschuetz, a Meditech engineer. This compares with a twofold gain in speed from just running a recompiled program on a RISC processor. "It just is not worth it," Anschuetz said.

Commercial software built to exploit RISC processors does not yet exist, according to Vicki Brown, a workstation analyst at International Data Corp., a Framingham, Mass.-based market research firm.

Brown said she doubts vendor assertions that software houses are scurrying to develop commercial RISC applications. In fact, only 10% of present Unix software is considered commercial, she added, and less than 1% for RISC.

Need to speed?

What can users expect to gain from the 40,000 RISC systems purchased this year? "Speed, and that's about it," said Tom Heim, a systems analyst at TRW Space and Defense, Inc. in Redondo Beach, Calif. Heim is using Hewlett-Packard Co.'s Apollo division's 10000s for computer-aided design and manufacturing applications. "For most of these applications, all you need is speed. For this price, that's enough."

While RISC systems and software have a way to go before becoming a commercial hit, they are being warmly welcomed into technical computing sites by users who develop their own code.

High-powered computing propels General Electric Co. aircraft engine group's research and development efforts. With millions of dollars invested in Digital Equipment Corp. VAXs and VMS software, "we bit the bullet and made the painful conversion" to RISC and DEC Ultrix for three-dimensional applications and numerical analysis, said Gary Bedrosian, a GE electrical engineer.

"When you make the jump from 2-D to 3-D, your CPU speed, disk storage and random-access memory requirements go up by a factor of 100," Bedrosian said. But Decstation 3100s ran GE's most exacting code at half the speed of a Convex C2-10.

Acknowledging that DEC's present Ultrix application support "is a problem," Bedrosian said DEC's RISC Fortran compiler was much stronger than Sun Microsystems, Inc.'s. But he does not recommend RISC systems to GE's nontechnical groups. "RISC is great for us because our engineers can fine-tune them," Bedrosian said. "But for information management, you want something dependable."

WILLIAM BRANDEL

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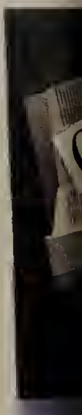

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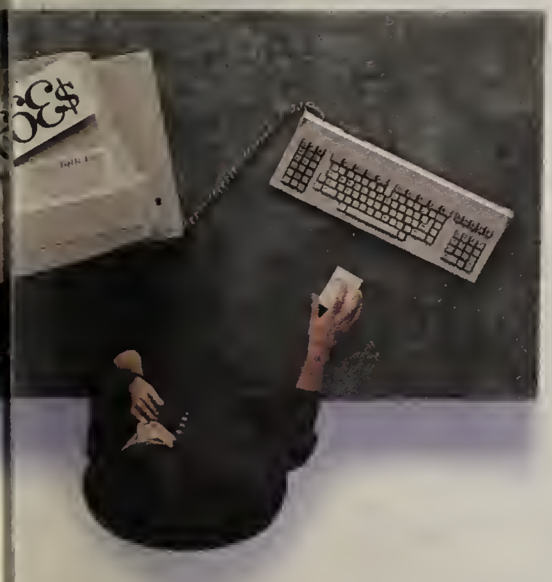

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Font

FROM PAGE 33

technology that will be fully compatible with Postscript. If the largest systems and applications developer can come together on a single standard with the leading independent font vendor, then users may see a de facto, market-driven standard.

Despite casting what appear to be halfhearted aspersions on Microsoft and Apple's ability to create a true Postscript clone, Adobe has already shifted gears and is preparing to compete on a better quality product, rather than on a proprietary standard.

"We will continue to upgrade the Postscript interpreter and will come out soon with a new Adobe Type Manager product for the PC," said Pat Marriot, director of marketing at Adobe. "We are prepared to compete with the Microsoft offering on any level."

The competition should help users by spurring the creation of new products. "It is no longer a one-horse race. Adobe has been quick to respond to the competitive pressure with beneficial pricing and product changes," said Frederick Ruvkin, who covers Adobe at Morgan Stanley & Co. But even if Microsoft and Adobe come through, there are likely to be hitches in the transition to a multiplayer font segment of the business.

HP has said repeatedly that it will gauge market acceptance of the new font before supporting it. While that would likely change if Apple and Microsoft announce a solid offering, HP is also actively peddling its own bit-mapped and scalable font technology, which is neither Postscript nor Royal compatible. This could complicate its acceptance of the new technology.

"These are short-term hiccups, but there is no reason to believe that Apple and Microsoft will not come through as promised," Ruvkin said.

Keefe

FROM PAGE 33

lying behavior by computer sales representatives. You'll never have a better chance.

For example, did you hear the one about User A, who told a reporter what he paid for his system, only to have User B, who paid a much higher price, go bananas because the salesman for Vendor X told him he was getting the lowest price possible? Well, rather than humble himself before the customer he apparently lied to, the salesman got User A's salesman to give User A a tongue-lashing for publicizing his purchase price.

Then there is the user who resisted the salesman's entreaties that he move to an (obviously) more expensive system. In his professional judgment, the IS manager felt such a move wasn't warranted but after much pressure, opted to go with — God forbid — a *used* model.

Well, our salesman wasn't going to stand for that. With the intent, no doubt, of protecting the user's interests and future, he went over his head to the CIO, where he pleaded his case, suggesting that the IS manager was making a B-I-G mistake. No, the CIO didn't hang the IS manager, but he sat through the presentation and assault on his manager's competence. As for the IS manager, he was left to teeter on thin ice for a while.

Then there are the vendors who, miffed for whatever reason, play games by holding up product delivery or delaying service calls.

Users need to stand up for themselves. Not because the press is afraid you won't let us quote you for fear of offending your suppliers, but because you are the buyer, after all, and you should be in the driver's seat. This is even more important in the face of trends such as outsourcing. Anytime you hand over a degree of control to a vendor, it becomes even more imperative to show who's boss.

Perhaps the best way to counteract these terrorist sales tactics is to fight fire with fire. Develop a relationship with your CIO or CEO. Keep him or her apprised of any major decisions pending or cut. They'll be better prepared for an ambush from a sulking sales rep.

This is especially true where a CEO unfamiliar with computer systems might prove an easy mark for an aggressive salesperson to overwhelm (and undermine you) with technical jargon. You *can* prevent forest fires.

If your contract guarantees delivery on a certain date or a service response with a certain time frame, insist that the vendor live up to it. Insert penalty clauses for failure to comply; you are paying a lot for support.

If you don't belong to a user group, join one. If you do, and you find that other customers are being subjected to the same kinds of tactics, wield the power and influence of the user group to put a stop to it. Vendors who might ignore a single user will take notice of a crowd.

Why allow suppliers to browbeat your people, flout service agreements or go behind your back to call summit meetings between their regional or divisional bosses and the company CIO? Resolve in 1990 to take control of your account. Salespeople may come and go, but you have to live with your purchasing decisions.

Keefe is *Computerworld's* senior editor, PCs and workstations.

Technology leaps raise the specter of forgery

BY JAMES DALY
CW STAFF

Corporate America, beware. The same leaps in desktop publishing technology that brought professional-quality printing to the simplest computer shops have also inadvertently created a Frankenstein's monster.

With as little as $5,000 worth of equipment, the production of phony work orders, receipts, bank checks and even stock certificates has become a high-tech snap, according to a report recently released by Micro Publishing Press in Torrance, Calif.

This is partly because of the fact that many legitimate documents are created by the same systems producing the forgeries.

"The misapplications of desktop publishing are almost as numerous as the legitimate uses," said James Cavuoto, publisher of "Desktop Publishing Forgery: The Potential For Abuse." He added, "There is the potential for a lot of people to get hurt."

The report paints a picture of how any unscrupulous individual with half a brain and a few dollars can go on an illegal rampage.

An entire forgery setup — personal computer, publishing software, laser printer with typographics fonts and a scanner to capture photographs as well as text and line drawings — can be purchased in minutes at a typical computer store, the report noted.

Perhaps the greatest potential for abuse lies in the production of everyday forms of identification, such as letters of reference, diplomas, college transcripts or business cards.

Although the typical 300 dot/in. output from a laser printer is far removed from the 1,200 dot/in. resolution of most professional typesetting equipment, the report said that by running images through a high-resolution image scanner, output quality of up to 2,540 dot/in. is possible.

Easy accessibility to sophisticated technology threatens to make a bad problem worse. "I think we'll start seeing people [attempt to create forged documents] just for the lark of it," said Richard McDrew, special agent in charge of the U.S. Secret Service office in San Francisco. McDrew cited one case that occurred last fall in which a group of forgers in Concord, Calif., used a color copier to produce a large quantity of false identification cards.

While Cavuoto argued that no prevention technique is puncture-proof, crucial steps can be taken to lessen the chance of disaster. A key defense is the avoidance of standards, which make it easy for one user to copy the work of another, in certain situations.

The area in which this is most evident is type. Nearly everyone uses the same three typefaces: Times, a serif typeface; Helvetica, a sans-serif typeface; and Courier, which resembles typewriter output. "Avoid these when producing sensitive documents," Cavuoto said. "Either purchase a less-popular typeface or create your own using one of several font design software packages on the market."

Other defensive maneuvers: Create intricate logos with fine lines and detailed features that are difficult to reproduce; use color images when possible; and make your graphics a full page wide so the imperfections in a forged copy can be quickly recognized.

Perhaps the easiest precaution is in the type of paper used. Find a paper that is limited in distribution or customize the paper with a water mark or embossing. Use nonstandard colors.

The report noted that a Los Angeles firm called Light Signatures produces a scanning system that takes advantage of the fiber patterns in sheets of paper, which are as individual as fingerprints. The Signa Three system stores information about each certificate's fiber-print and compares it with the copy traded in.

Ultimately, the greatest deterrent is awareness, according to the report. "Everyone should become a little more skeptical about the origin of important documents," Cavuoto said. "Awareness is the best weapon against desktop publishing-related forgery."

NEW PRODUCTS

Software applications packages

Bitstream, Inc. and Aldus Corp. have jointly announced that a Bitstream Fontware 3.0 starter kit will be available to users of Aldus Pagemaker 3.0 for personal computers.

The starter kit, which includes a Fontware 3.0 Installation Kit for Microsoft Corp. Windows and eight typeface outlines, will be offered to Aldus Pagemaker users at a price of $25. The kit will also provide users with access to a library of 52 Fontware typeface packages.

Bitstream
Athenaeum House
215 First St.
Cambridge, Mass. 02142
617-497-6222

Trax Softworks, Inc. has introduced Version 5.0 of its Electronic Spread Sheet (ESS).

The product offers features such as a linked spreadsheet function, command stacking, an autosave function, template spreadsheets and spreadsheet catalog description. According to the vendor, the product can print spreadsheets out of any printer that has an Adobe Systems, Inc. Postscript interpreter.

The price for ESS 5.0 ranges from $9,000 to $18,000, depending on CPU size.

Trax
10801 National Blvd.
Los Angeles, Calif. 90064
213-475-8729

Software utilities

A memory-resident software program designed to capture data and text from the screen of virtually any software program for display as a graph or chart is now available from New England Software, Inc.

Called Graph-in-the-Box Executive, the package provides 15 different chart types, nine fonts and three-dimensional effects. The software requires 10K bytes of memory when not activated, which is less than 10% of what was previously possible, the firm said. It is priced at $299.95. A hard disk drive is recommended.

New England Software
Greenwich Office Park 3
Greenwich, Conn. 06831
203-625-0062

Development tools

Solution Systems has announced the release of Brief 3.0, which reportedly allows C programmers to write macros without switching between C and a different macro language.

A source-level debugger works with the original Brief macro language syntax and the Cbrief "C-like" macro language. Programmers can visually step through their macro code while it is running, examine variables and set break points.

Programmers can also play back a sequence of keystrokes on demand, even between editing sessions, according to the vendor. The software includes template editing for Ada, Cobol,

Continued on page 48

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DECsystem 5400 System

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DECsystem 3100	14.3	24MB	2.0 Gbytes	4.0 MB/s
DECsystem 5400	16.6	64MB	9.7 Gbytes	8.0 MB/s
DECsystem 5810	18.7	256MB	115 Gbytes	50 MB/s
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*Integer MIPS are based on a combination of Dhrystones, grep, yacc, diff and nroff benchmarks.

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Continued from page 44

Basic, Fortran, Modula-2, Pascal and C languages. The maximum number of lines per file has been increased to over two billion in the new release. The price is $199.

Solution Systems
Suite 410
541 Main St.
S. Weymouth, Mass. 02190
617-337-6963

OS/2 software

Xerox Imaging Systems, Inc. has announced a desk-accessory scanning software product for IBM Personal Computers, Personal System/2s and compatibles running under OS/2 and IBM Presentation Manager.

Called PM Mate, the package was created specifically for OS/2 Presentation Manager versions of Xerox Ventura Publisher and Aldus Corp.'s Aldus Pagemaker desktop publishing programs. It allows users to scan in photographs and line art without exiting either publishing program, the company said. The program carries a retail price tag of $129.

Xerox
535 Oakmead Pkwy.
Sunnyvale, Calif. 94086
408-245-7900

Macintosh products

Versacad Corp. has announced an architectural computer-aided design package for the Apple Computer, Inc. Macintosh.

Called Versacad/Architect, the package was created to run from within the Versacad/Macintosh Edition program and includes automatic layer management and associative dimensioning capabilities. A variety of door and window styles are also provided. The software is priced at $295.

Versacad
2124 Main St.
Huntington Beach, Calif.
92648
714-960-7720

Training

A reference guide for Microsoft Works 2.0 users is available from The Cobb Group, which authored and published the 776-page book, as well as from bookstores. To help users learn the Microsoft Works program faster, *Works 2 Companion* reportedly explores Microsoft's integrated software, including multiple windows, file management, applications launcher, thesaurus, templates and graphics display.

The book is organized by function, rather than by command name, and contains an index with over 1,400 entries, according to the company. The bookstore price is $22.95.

The Cobb Group
P.O. Box 35160
Louisville, Ky. 40232
800-223-8720

A computer hardware device that creates computer-based training using standard audio cassette tapes has been announced by Fastrain Learning Systems, Inc.

The Fastrain product will reportedly work with any software program, including off-the-shelf and customized packages. The device attaches to the computer keyboard to record the instructor's voice commands and keystrokes and then plays back the voice and on-screen information for the benefit of the student.

Priced at $2,000, the Fastrain FT100 includes the Fastrain unit, operating manual, introductory tape, keyboard extension cable and transformer. Other configurations are also available.

Fastrain Learning Systems
100 Pleasant Hill Ave. N.
Sebastopol, Calif. 95472
707-823-7613

Peripherals

QMS, Inc. is shipping a monochrome Adobe Systems, Inc. Postscript laser printer priced at $9,995. The QMS-PS 2200 Model B, according to the vendor, is the first printer with 11- by 17-in. Postscript output capabilities under $10,000.

The printer ships with RS-232 serial, Centronics Parallel and RS-422/Appletalk interfaces to provide connectivity to a variety of computer systems.

The vendor has also announced a sales promotion for users ordering the company's $15,995 QMS-PS 2200 Model E laser printer. For every unit pur-

chased, a QMS-PS 820 turbo printer is available for $3,495. The promotion, which ends March 31, is cumulative; thus, by ordering two Model Es, the customer can receive a turbo printer for free.

QMS
P.O. Box 81250
One Magnum Pass
Mobile, Ala. 36689
205-633-4300

A 19-in., one-megapixel monochrome monitor has been introduced by Hyundai Electronics America.

The HMM-1900 is targeted for computer-aided design and commercial information systems applications and can be used as a display with Apple Computer, Inc., IBM Personal Computer and compatible platforms. It includes driver support for Wordperfect Corp.'s Wordperfect, Lotus Development Corp.'s 1-2-3 spreadsheet, Autodesk, Inc.'s Autocad and various other software packages.

The monitor carries an 18-month warranty and is priced at $1,099.

Hyundai Electronics
166 Baypointe Pkwy.
San Jose, Calif. 95134
408-473-9200

A 16-in. computer monitor designed to provide photographic-quality resolution in desktop publishing, computer-aided design and graphics workstation environments has been introduced by Nanao U.S.A. Corp.

The Flexscan Model 9070U is a high-resolution, multiscanning color monitor with a 0.28mm dot pitch, according to the firm. Maximum resolution is 1,024 by 768 dot/in. noninterlaced, and the unit can be used with either IBM or Apple Computer, Inc. platforms. Its suggested retail price is $1,779.

Nanao
23510 Telo Ave.
Torrance, Calif. 90505
213-325-5202

Imaging Technology, Inc. has announced that its Series 151 image processor is now fully compatible with Sun Microsystems, Inc.'s Sparcstation 330 and 370 workstations.

The product consists of more than 15 boards, and its modules are packaged in multiboard enclosures that only need one slot in a host, according to the company. The Series 151 also supports Sun-3, -4 and Sun 386I platforms, as well as IBM Personal System/2s and Personal Computer AT-compatibles.

A basic version of the processor includes acquisition, display, frame memory and real-time processing capabilities such as image averaging and subtraction. It costs $12,495.

Imaging Technology
600 W. Cummings Park
Woburn, Mass. 01801
617-938-8444

Board-level devices

National Instruments Corp. has announced an Extended Industry Standard Architecture (EISA) plug-in data acquisition board and two associated software products for developing industrial and laboratory test, measurement and control application programs.

Designed for use by scientists and engineers to develop personal computer-based data acquisition systems, the EISA-A2000 board fits into any EISA slot of an EISA-bus computer and costs $2,995.

The Visionscope and DOS Labdriver software packages are priced at $295 each.

National Instruments
12109 Technology Blvd.
Austin, Texas 78727
800-433-3488

A digital audio board that offers two-channel stereo and compact-disc quality recording and playback functions has been announced by Antex Electronics Corp.

The Series 2/Model SX-10 fits into the expansion slot of any IBM Personal Computer AT, Personal System/2 Model 30 or Intel Corp. 80286- or 80386-compatible machine, the company said. Applications include multimedia presentations, point-of-sale systems and interactive video communications.

The list price for the product is $1,995.

Antex
16100 S. Figueroa St.
Gardena, Calif. 90248
213-532-3092

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* The Wall Street Journal (1987) - "Survey of the Information Processing Marketplace".
* The Adams Co. (1988) - "Information Systems Management Study."

COMPUTERWORLD

NETWORKING

DATA STREAM

Ellis Booker

Untethering data comm

"I'll be off the scope from 1:00 to 1:45," the traveling executive tells his office from a pay phone at O'Hare Airport in Chicago.

By this, he means he'll be unreachable — perhaps in a taxi riding to the Loop — and so won't be able to make or place any calls.

Staying in touch has become something of an American pastime. Pocket pagers sparked this phenomenon; cellular phones threw gasoline on the fire. Cellular phones themselves went mobile soon after their introduction, moving from the trunk of the car to the passenger seat and recently into the coat pockets of those lucky, always-on-the-scope few able to pay the $2,495 price of such expensive, miniature marvels as Motorola's Microtac Personal Telephone.

No less than Motorola, as it happens, wants to address an overlooked segment of the traveling public: data users.

In January, Motorola and IBM announced plans to merge their radio-based data communications networks and make them available to the public.

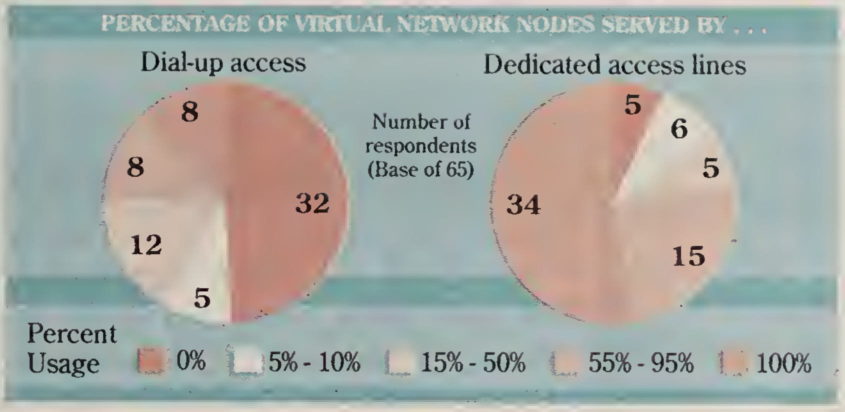
Continued on page 58

Virtual network equals savings

BY ELLIS BOOKER
CW STAFF

Bargain hunting

Most virtual network users have opted for cheaper dedicated lines to their carriers rather than for the convenience of dial-up lines



Source: The Yankee Group

CW Chart: Doreen Dahle

No doubt about it: A virtual network can be a cost-effective alternative to the conventional method of leasing dedicated lines to build a company's private communications network.

Virtual networks start with the carrier's public network and, under software control, isolate logical portions to individual customers. From that point, the features and functions of this "shadow" network are similar to that of a conventional one.

Virtual networks do not offer the same level of control as those built on leased facilities — for example, carriers, citing obvious security concerns, do not enable customers to modify the carrier's own routing-table databases. However, users of virtual services said they realize significant savings.

To start, rates for virtual networks can be up to 30% less expensive than those of conventional long-distance services. In addition, users avoid capital expenses such as the cost of network equipment and communication staffs associated with private networks. Users also benefit by having one source for management and billing reports.

"We see aggressive marketing for virtual networking among the three carriers," said Steve Sazegari, a senior industry analyst at Dataquest, Inc. in San Jose, Calif. Sazegari said this market, now growing at 17% to 18% annually, was worth $1.5 billion in 1989 and will grow to a $5.1 billion business by 1993.

Sazegari said there are some 750 virtual networking customers in place, the majority of whom use AT&T's Software Defined Network (SDN) service. This estimate cannot be confirmed, however, as AT&T, MCI Communications Corp. and U.S. Sprint Communications Co. will not divulge the size of their customer bases.

The virtual network is an overlay of the long-distance car-

Continued on page 58

Bell drawing up plans for local-level service

ANALYSIS

BY MITCH BETTS
CW STAFF

Don't hold anyone to the exact date, but sometime in the mid-1990s, network managers may be able to obtain the kind of virtual private network services from local telephone companies that are now available for the long-distance portion of their networks.

The vehicle for providing customized network services at the local level is a still-fuzzy concept called the Intelligent Network, an architecture for the local-exchange network that is being drawn up by Bellcore.

In essence, the architecture places the "intelligence" for running the local-exchange network in centralized data processing centers rather than embedding them in each central office switch. In theory, users will then have access to those central processors and databases for the purpose of managing their own switched traffic, according to Steve Sazegari, a senior analyst at Dataquest, Inc. in San Jose, Calif.

For users, this could mean customized call routing, advanced billing, bandwidth on demand services and virtual private networks, he said. "With Intelligent Network, the end user need not presubscribe to services. Users can write their own tickets as they use a service and then pay for only the amount they use," Sazegari said.

He predicted that primitive Intelligent Network services will be available in 1992 or 1993. Already, Ameritech and Bellsouth Corp. have announced service trials for 1991, but the full-blown Intelligent Network may not arrive until 2001.

The futuristic architecture for the public network may be a step in the evolution away from purely private networks. In the future, "more and more elements of the public network will be utilized within the private network," Sazegari said.

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Inside

- Network management taking higher priority. Page 54.
- AT&T hops on LAN Manager bandwagon. Page 62.
- Bellcore develops packet simulator. Page 62.

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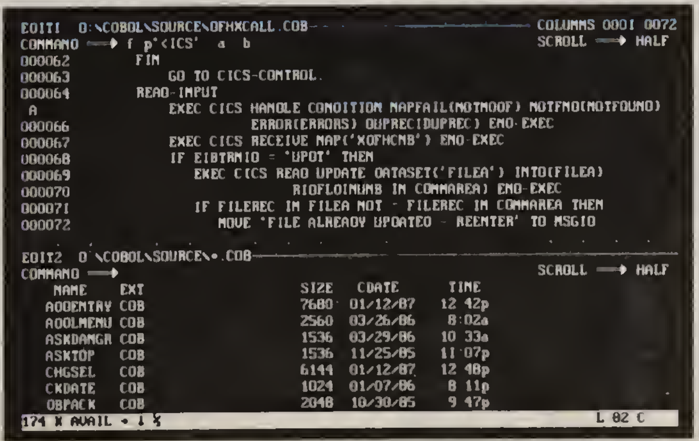

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EDIT1  D:\COBOL\SOURCE\OFHXCALL.COB------------------------- COLUMNS 0001 0072
COMMAND ──> f p'<ICS'  a  b                                  SCROLL ──> HALF
000062         FIN
000063             GO TO CICS-CONTROL.
000064         READ-INPUT
 A                 EXEC CICS HANDLE CONDITION MAPFAIL(NOTMODF) NOTFND(NOTFOUND)
000066                       ERROR(ERRORS) DUPREC(DUPREC) END-EXEC
000067             EXEC CICS RECEIVE MAP('XOFHCNB') END-EXEC
000068             IF EIBTRMID = 'UPDT' THEN
000069                EXEC CICS READ UPDATE DATASET('FILEA') INTO(FILEA)
000070                            RIDFLD(NUMB IN COMMAREA) END-EXEC
000071                IF FILEREC IN FILEA NOT = FILEREC IN COMMAREA THEN
000072                   MOVE 'FILE ALREADY UPDATED - REENTER' TO MSGIO

EDIT2  D:\COBOL\SOURCE\*.COB-------------------------------------------------
COMMAND ──>                                                  SCROLL ──> HALF
    NAME     EXT                     SIZE   CDATE      TIME
   ADDENTRY  COB                     7680  01/12/87   12 42p
   ADDLMENU  COB                     2560  03/26/86    8:02a
   ASKDANGR  COB                     1536  03/29/86   10 33a
   ASKTOP    COB                     1536  11/25/85   11 07p
   CHGSEL    COB                     6144  01/12/87   12 48p
   CKDATE    COB                     1024  01/07/86    8 11p
   DBPACK    COB                     2048  10/30/85    9 47p
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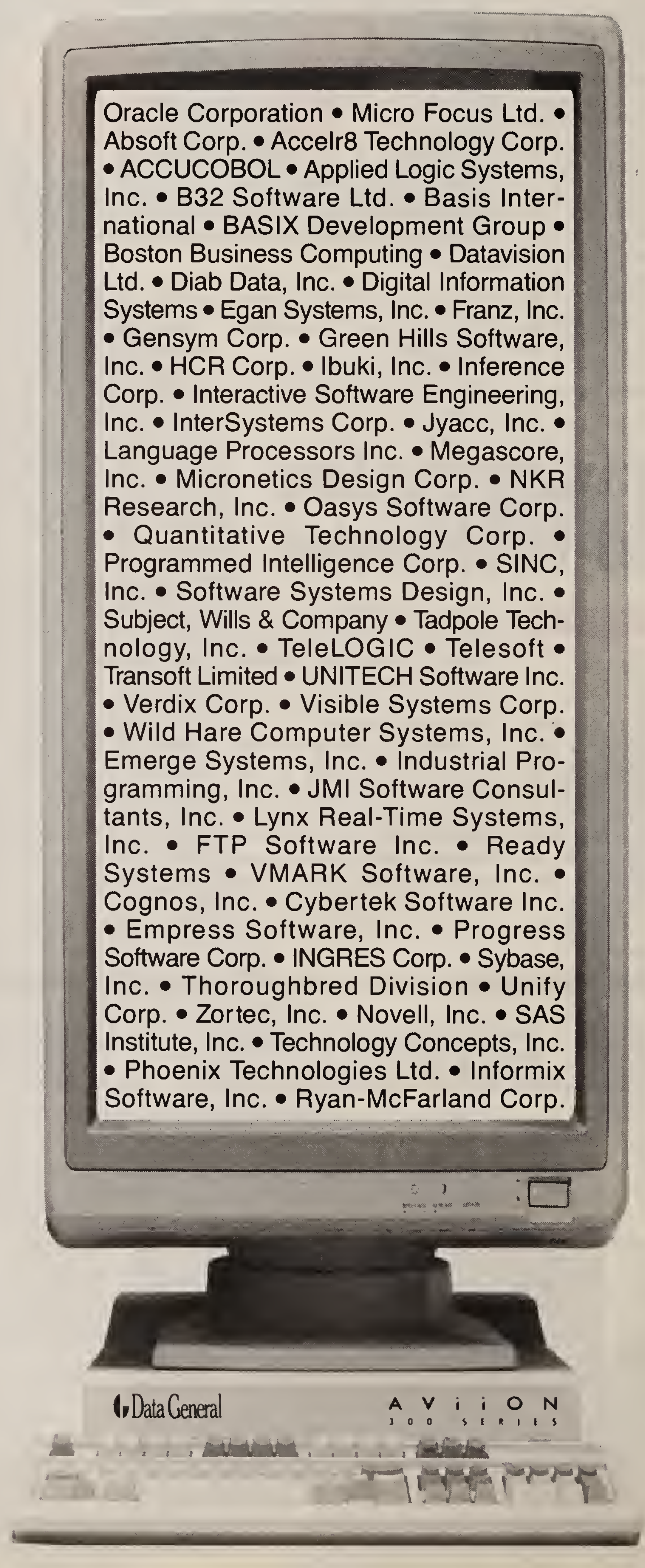

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Net management moving up

BY JOANIE M. WEXLER
CW STAFF

Network management is working its way up the priority ladder in large corporations, according to a recent survey by Business Research Group (BRG) in Newton, Mass. The firm said that over 75% of 300 Fortune 1,000 companies interviewed intend to increase their budgets for network management by nearly 48% within the next two years.

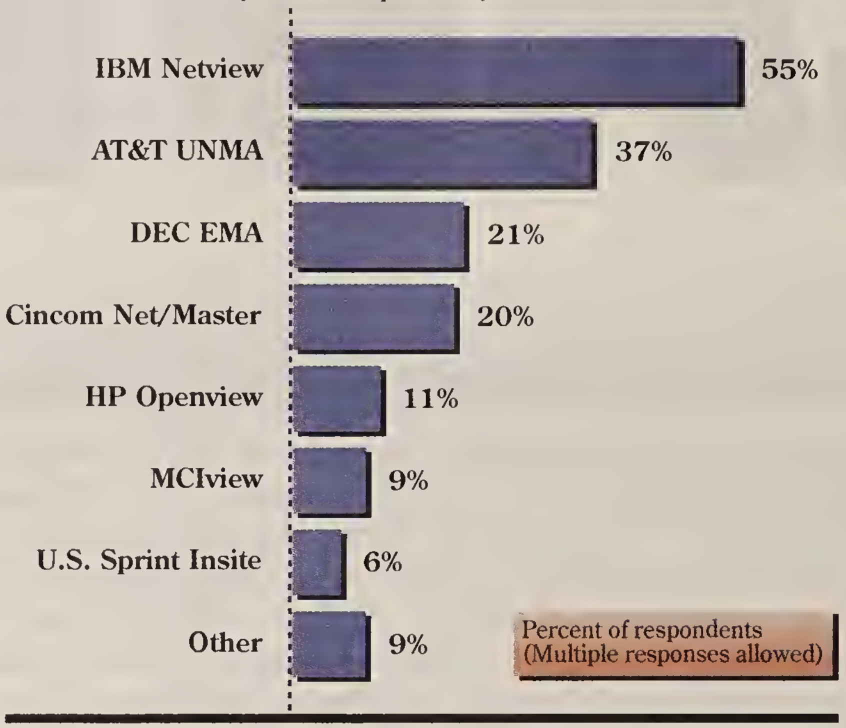
The forthcoming budget increases parallel an industry trend toward linking autonomous local-area networks, often from different vendors, into one large network to be collectively managed.

The survey included companies from the finance, manufacturing and transportation/utilities industries. Half the firms polled are planning to use integrated network management systems, according to Kevin O'Neill, vice-president of networking research at BRG.

O'Neill explained that whether companies pursue an integrated approach depends on the degree to which they are using different vendors' equipment in their networks.

Netview by a length

Half of the 300 companies surveyed plan an integrated approach, citing IBM's Netview most often as their product of choice



Source: Business Research Group

CW Chart: Marie Haines

He added that the industry with the strongest trend toward integrated management was manufacturing, which overall runs more "multivendor" networks.

"19% of the manufacturers surveyed don't even have a mainframe," O'Neill noted.

One manufacturer pumping up its network management budget is Quaker Oats Co. in Chicago. Jon Kozuch, manager of technology planning and support, explained, "We're linking LANs to give our executives better access to client information."

Kozuch said that he is looking at multiple integrated network management products because his networking scenario includes a hodgepodge of IBM, Digital Equipment Corp., Novell, Inc. and other systems he must tie together.

Kozuch said the most important feature in the network management system he selects will be the ability to isolate problems. There are 35 LANs in Quaker Oats' corporate headquarters and "isolating an outage currently takes a lot of people doing a lot of investigating," he added.

O'Neill said that overall, the most important network management consideration to surveyed users was the credibility of the vendor and postsale support. "Network management is an extremely complex problem for most users; they need the help of their vendor," he explained. "This means that 'Acme Unknown, Inc.' could come out with the best network management system in the world but have a very difficult time selling it."

O'Neill added that at this point users are more concerned with basic network management functions for increasing network reliability and security and lowering operating costs than they are with fancy graphical user interfaces and fourth-generation languages.

In contrast to manufacturing companies, financial firms tend to have fairly homogeneous, IBM-based networks. Ninety-five percent of BRG's survey respondents said that IBM was their primary or secondary mainframe vendor.

Two financial companies — Mercantile Bank Corp. and Wells Fargo Bank — do not expect to spend more on network management over the next couple of years because, as IBM-based shops, they are already using IBM's Netview integrated network management system and are satisfied with it.

John H. Lee, senior vice-president and manager of information services at the St. Louis-based Mercantile Bank, and Bob Sevacko, vice-president and data center operations manager at Wells Fargo in San Francisco, both added that standards considerations had not become an issue for them yet. "But in the future, I'm sure we're all going to have to get involved with standards," Sevacko said.

Lee said he is "hoping and waiting" for Integrated Services Digital Network so he can "combine carrier management and equipment," which he hopes will let him spend less on network management but get more.

Bell

FROM PAGE 51

However, users want to make sure that the local transport and switching functions are truly unbundled so that they can pick and choose from a menu of basic service elements — and not have to pay for services they do not need.

That was the message of users who spoke at an Intelligent Network conference in Washington, D.C., last December. One was Michael J. Kilbane, general manager of the technical services and telecommunications group at Diamond Shamrock Refining & Marketing Co. in San Antonio, Texas.

> USERS WANT TO make sure that the local transport and switching functions are truly unbundled so that they can pick and choose from a menu of basic service elements — and not have to pay for services they do not need.

Kilbane urged carriers to provide unbundled elements of the Intelligent Network so that users could build their own unique applications rather than shoehorn users into preconceived applications.

Kilbane and Jerry Appleby, vice-president of telecommunications services at Security Pacific Automation Co. in Los Angeles, added that users care much more about the business applications of Intelligent Network than about the technical details.

Appleby said that his firm, which is in the banking industry, will be asking whether the Intelligent Network will "cause the bank to get more deposits and make more good loans. Otherwise, its function had better be to lower telecommunications expenses."

For the Bell operating companies, the new architecture promises to separate the call-processing function from the switching equipment. Today, processing voice and data traffic is tightly interwoven with the software that drives central-office switches.

Intelligent Network breaks that software down into a number of basic modules and moves it to a centralized data center. That way, the Bell operating companies can quickly reconfigure their services or add new ones quickly, by avoiding the process of ordering new software from the switch manufacturers.

"It's not an overstatement to say that it gives the Bell operating companies control over their businesses," said John G. Williams, vice-president of Telecommunications Consulting Group, Inc. in Washington, D.C.

The origin of the Intelligent Network concept was a proposal made several years ago by Ameritech for a Feature Node/Service Interface allowing operating companies to program their own switching machines.

Ameritech suggested to the Federal Communications Commission that if the software interface were made available to the telephone companies' competitors in the enhanced services market, then the FCC's structural separation rules would no longer be necessary.

Thus was born the regulatory concept of Open Network Architecture (ONA), a twin of Intelligent Network. However, Williams said that the telephone companies now avoid associating the two terms — even though they have a common origin — because they want regulatory relief well before the fully unbundled Intelligent Network will be ready.

Williams said that the telephone companies convinced a sympathetic FCC to weaken the concept of ONA, leading to user complaints that current ONA plans fail to provide any unbundling of the local network's basic service elements.

"I don't think we have ONA until we get to an Intelligent Network architecture, no matter what the FCC says," commented James S. Blaszak, a Washington, D.C., attorney representing a user group called the Coalition of ONA Parties.

In the meantime, the local exchange carriers are expected to employ an interim architecture called Next Generation Switching. The user group is concerned that the interim step could become a near-permanent bottleneck architecture unless the FCC forces the local carriers to migrate quickly to the unbundled Intelligent Network.

"The question is how long will we be in the Next Generation Switching mode and will there be standard interfaces and protocols to the switches or will they be closed and proprietary?" Blaszak said. "We want to be able to use the software in those switches to develop applications that meet our needs."

Intelligent exchanges

Bellsouth Corp. plans to conduct field trials in 1991 of the following Intelligent Network services:

- **Area number calling.** Businesses can advertise a single telephone number, but calls to that number will be routed to the business location nearest the caller.
- **Outgoing call management.** Blocks toll calls to selected numbers.
- **Record retrieval base.** Routes incoming calls and simultaneously retrieves records from a database.
- **Custom intercept with call complete.** Intercepts calls made to a nonworking number and provides a personalized verification that the call is being forwarded to the correct number.
- **Multilocation business extension dialing.** Allows Centrex users to dial a four- or five-digit number to reach other Centrex users.
- **Computer access restriction.** Enhances computer security by restricting dial-up computer access to calls originating from approved numbers.
- **Directory assistance call completion.** Connects customers dialing directory assistance for a number to that number.

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–a software developer

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–IBM

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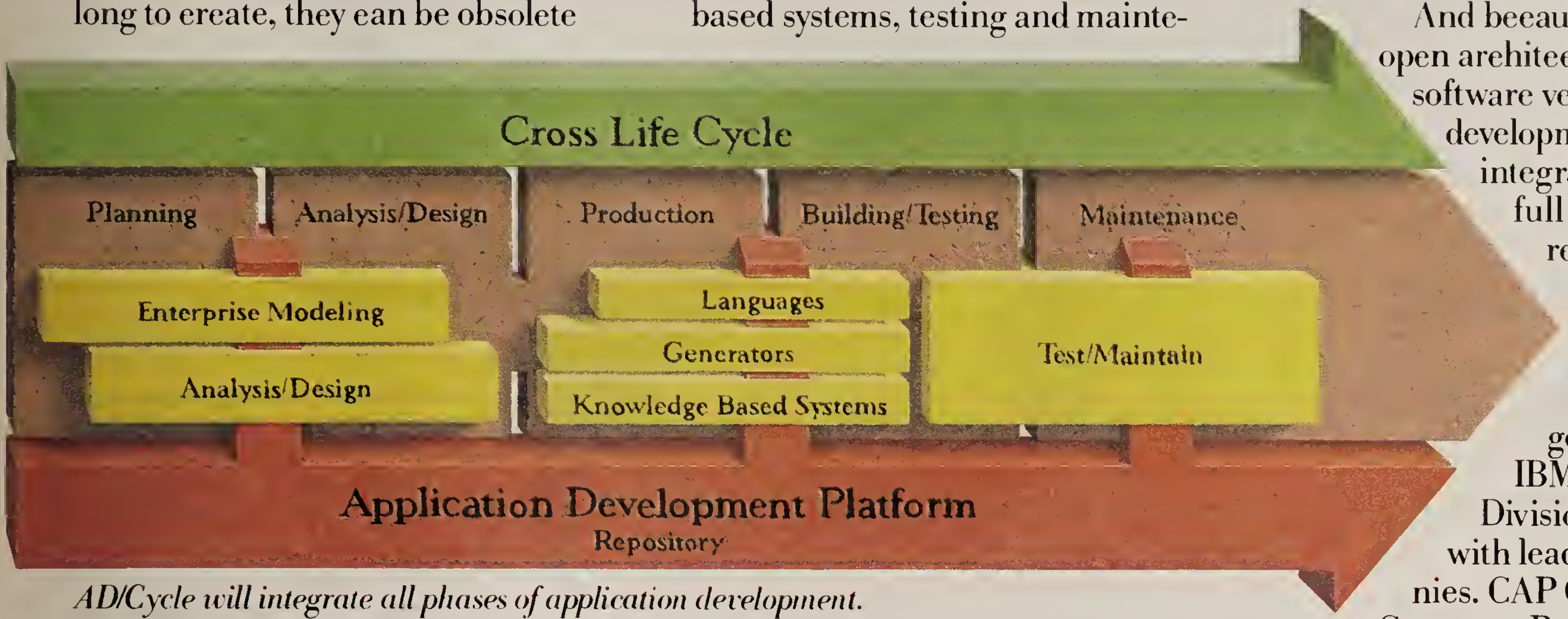

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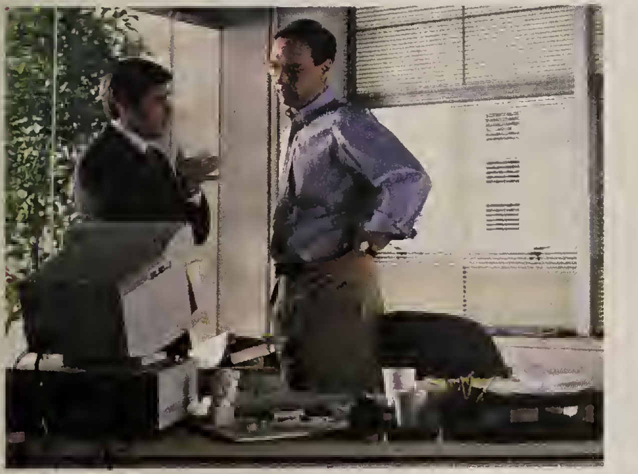

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AD/Cycle has too many tools to describe them all, but here are some highlights.

Along with products from IBM, key elements of AD/Cycle are coming from BACHMAN Information Systems, Inc., Index Technology Corporation and KnowledgeWare, Inc.™

Each is a leader in CASE technology, with products that reduce years to months, and months to days.

Their sets of tools will combine enterprise modeling, validation of models, data structure analysis and more, all using the graphical interface of SAA.

In addition, new releases of IBM Cross System Product (our application generator) will run on both OS/2™ EE workstations and hosts. Through CSP, many AD/Cycle tools can build applications for all SAA systems: OS/2, OS/400,™ VM and MVS.

And because AD/Cycle is an open architecture, many other software vendors are creating development tools that will integrate with it, taking full advantage of IBM's repository manager.

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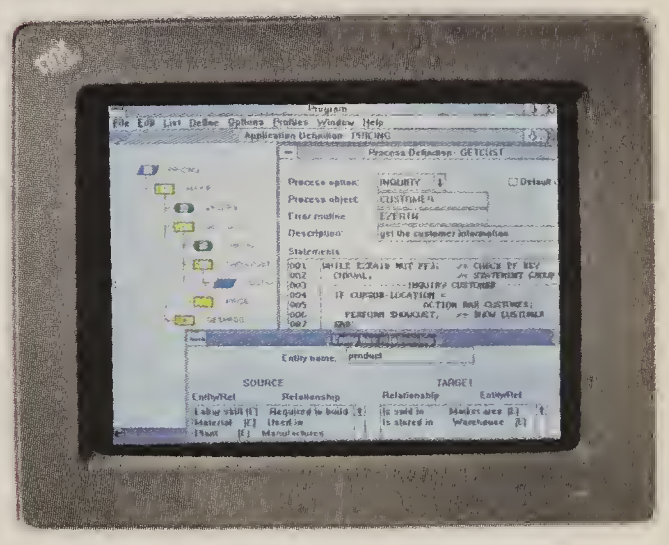
OS/2 EE versions of AD/Cycle tools will arrive through 1990, but you don't have to wait to get started. Many tools are available now, and with excellent track records.



All AD/Cycle products will have the easy-to-use, SAA graphical interface.

Response to AD/Cycle, from both vendors and users, has been overwhelmingly positive. Clearly, it represents the future of application development.

So for you, the question isn't if, but when. And when is now. To get started with AD/Cycle, call your IBM Marketing Representative today.

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Virtual network

CONTINUED FROM PAGE 51

rier's public network; therefore, users can access a virtual network through their local-exchange carrier's network.

Yet only about half of all virtual customers opt for this access rather than use dedicated links to a point of presence, according to a survey by The Yankee Group in Boston. For sites with low traffic or far from a point of presence, switched access can be valuable.

The deployment of fully digital services at the local exchange, including switched 56K bit/sec. lines and Integrated Services Digital Network (ISDN), should encourage switched access for virtual services, according to analysts.

With ISDN, users who now must dedicate T1 lines from offices to the interexchange carrier's point of presence will be able to dynamically allocate some circuits to the virtual private network and others to different services.

While virtual services are digital and thus can be used for data traffic, their packaging and pricing are more suitable for voice traffic, noted David Rappaport, president of The DMW Group, Inc., an Ann Arbor, Mich.-based consultancy.

"Virtual networks have switched-service pricing," he said. "Users pay based on the length of the connection and its distance, and they get time-of-day discounts and monthly aggregate volume discounts." For this reason, Rappaport added, permanent data links are more cost-effectively provided over a packet service or a private leased-line arrangement.

However, custom-pricing schemes such as AT&T's Tariff 12 take all a carrier's services and bundle them together at very attractive rates.

Network management, always an important issue for private networks, is no less key for virtual facilities.

Cathy Clarke, a senior analyst at The Yankee Group, noted that AT&T, MCI and U.S. Sprint offer dedicated terminals that allow users to "reconfigure their dialing plans and calling privileges and monitor the traffic on their circuits." However, she said the carriers have been and will continue to be hesitant to allow customers to reconfigure their networks interactively. "Customers can monitor their own portion of the network and see where a problem is located," she said, "but they can't take a wrench out and fix it."

The use of virtual facilities as a disaster recovery tool has singular advantages, said John Chiazza, second vice-president of technical support at Lincoln National Corp. in Fort Wayne, Ind.

The financial firm, which began using AT&T's SDN service last October, has already re-routed its service three times — first as a result of the Hinsdale, Ill., central office fire in May 1988, then because of the San Francisco earthquake last October and more recently because of a power outage in a central office. "We allow AT&T to do rerouting, and in the last case, it took just 20 minutes," he said.

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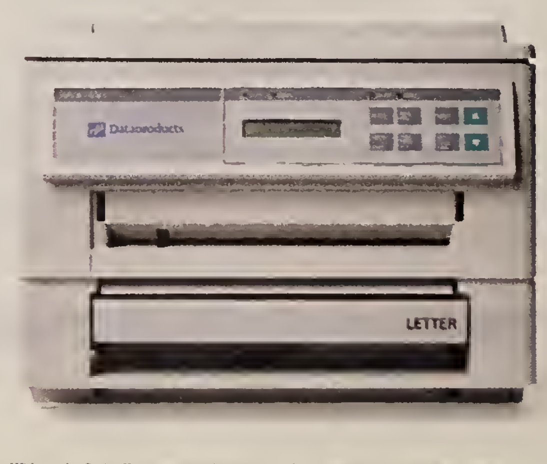

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Booker

CONTINUED FROM PAGE 51

ARDIS, as the venture will be known, is scheduled to go on-line next month and provide 2.4K bit/sec. connectivity for users in 8,000 cities around the U.S.

True, radio frequency technology doesn't have the cachet of digital cellular, mobile satellite or other more recent technology. And true, the founders of ARDIS aren't — well, at least yet — talking about novel applications. Since 1983, about 18,000 IBM and Rolm service people have been running around the country with "the brick," a radio-based data terminal developed by Motorola for use on the network.

But tell that to the very excited information systems manager who carried a Motorola "brick" to a subbasement five levels down in his office building in Manhattan and successfully logged onto an IBM host somewhere else in the U.S. He can't wait to get his sales force on ARDIS: No more interrupting hot sales meetings, he said, to hunt for a wall jack for one's portable computer. Just sit down, laptop on the lap and hit a button.

For traveling technical staffs, I believe ARDIS spells the end of the pocket pager. Why call the home office from the deli when the home office can *download* the customer's entire account into the computer in the briefcase at your feet?

ARDIS executives fudge somewhat about what the service will cost, a not-inconsequential topic, and Motorola and IBM have yet to deliver the all-important terminal gear and radio frequency modems that will make ARDIS a reality.

Still, I've got a hunch that their biggest challenge will be in expanding the capacity of the network to meet customer demand. This does not just come, of course, from an incisive analysis of the network and its capabilities, but mostly from the frantic Thursday afternoon I spent running around an airport in Atlanta looking for a phone jack, any jack, to which I could attach my laptop computer and transmit a late-breaking news story.

OK, there are ways to connect to phone lines quickly and easily today without radio frequency modems. But those with imagination will see what ARDIS and future services like it really suggest. It begins what James S. Ellis, New York Life's vice-president of telecommunications, brilliantly calls the "untethering" of data communications.

Booker is *Computerworld's* Midwest bureau correspondent.

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AT&T to support LAN Manager

BY JOANIE M. WEXLER
CW STAFF

BOSTON — It seems that support for Microsoft Corp.'s LAN Manager network operating system for expanded client/server computing is the latest "interoperable" thing to do — and AT&T is not about to be left out in the cold.

AT&T Computer Systems announced at the recent Networld '90 show that it has developed a new version of its Unix-based Stargroup network operating system that is compatible with LAN Manager technology.

AT&T's new LAN Manager Server, slated for April availability, reportedly expands AT&T work-group users' connectivity options by supporting MS-DOS, OS/2 and Unix clients, SQL servers and many LAN Manager application program interfaces (API), which allow application programs to talk to communications software. The API support means that LAN Manager applications are able to run in Unix environments as well as OS/2 environments.

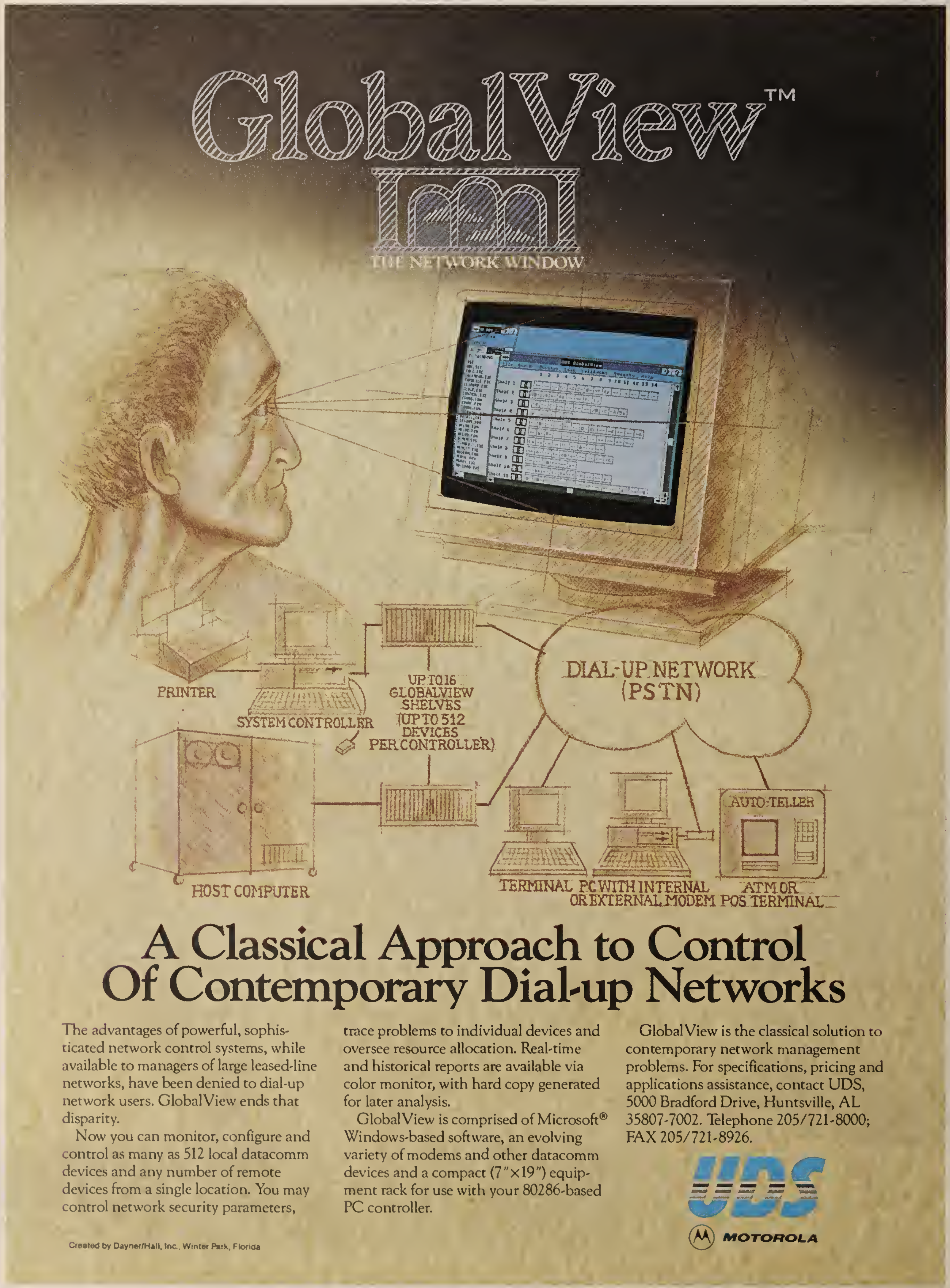
Unix commands made easy

The product reportedly combines multiuser and server capabilities on a single processor, and users will be able to execute Unix commands from any client without logging onto Unix.

In addition, the product will allow network administration from a DOS or OS/2 client, whereas other products reportedly allow that function from an OS/2 client only.

The software will be supported on all AT&T Starlan, Starlan 10 and EN100 Ethernet cards as well as on other vendors' hardware, including IBM Token-Ring and 3Com Corp. Etherlink products. Support for the Network Driver Interface Standard reportedly allows Stargroup software to run on a variety of network hardware platforms.

Stargroup Software LAN Manager Server costs $3,495 for an unlimited server configuration.



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GlobalView is comprised of Microsoft® Windows-based software, an evolving variety of modems and other datacomm devices and a compact (7"×19") equipment rack for use with your 80286-based PC controller.

GlobalView is the classical solution to contemporary network management problems. For specifications, pricing and applications assistance, contact UDS, 5000 Bradford Drive, Huntsville, AL 35807-7002. Telephone 205/721-8000; FAX 205/721-8926.

Created by Dayner/Hall, Inc. Winter Park, Florida

NEW PRODUCTS

Local-area networking software

Bellcore has developed Packnest, a software package that allows network planners to simulate small packet networks, monitor operations and analyze potential data transmissions on the network.

The software enables users to view a simulated network on a terminal connected to a host, the vendor said. While simulated packets are in transit, the network displays link usage statistics and a list of errors that could occur when sending messages. Telecommunications managers can use this data to see how the network will be affected by changes in traffic loads and protocols.

The product is fully compliant with the X.25 standard for packet-switching. Its price is $6,500.

Bellcore
290 W. Mt. Pleasant Ave.
Livingston, N.J. 07039
800-521-2673

Para Systems, Inc. has announced power protection software for Novell, Inc. Netware 386 local-area networks that operate in conjunction with Para Systems' uninterruptible power supplies (UPS).

Minuteman Network Manager 386 provides automatic shutdown and local and remote notification in the event of a power failure affecting the network.

The software runs as a Netware Loadable Module on the network file server. It automatically handles the configuration details of Netware 386 and determines what timing values to use during shutdown on the basis of the model number of its Minuteman UPS. The price is $199.

Para Systems
1455 LeMay Drive
Carrollton, Texas 75007
800-238-7272

Diagnostic equipment

Advanced Computer Communications has unveiled its ACS 4810 LAN Monitor.

The product allows Ethernet local-area network devices to be monitored from an ACS 4800 central management station regardless of their support of the Simple Network Management Protocol, the vendor said.

The ACS 4810 can communicate through routers and bridges, and the device responds directly to the ACS 4800 console during a network failure, according to the company.

The product is scheduled to be available in April at a cost of $4,500.

Advanced Computer
720 Santa Barbara St.
Santa Barbara, Calif. 93101
800-444-7854

A surge protector designed specifically for coaxial, surge and interference network problems is now available from Electronic Specialists, Inc.

The BNC-Net is offered in both "tee" and "on-line" configurations and provides three-stage line-to-shield and shield-to-ground spike suppression.

The protector is priced from $60.

Electronic Specialists
171 S. Main St.
Natick, Mass. 10760
508-655-1532

Romancing the segment of one

'Database marketing' allows companies to get to know their customers . . . intimately

BY MITCH BETTS
CW STAFF

Robert de Michiell

“*We know millions and millions of people intimately — right down to their shorts.*”

— National Demographics & Lifestyles, Inc.

Mass marketing is dead, and niche marketing is not good enough. The theme for the 1990s is marketing to a “segment of one.”

“We call the '90s the age of the individual,” says Robert J. Drummond, senior vice-president at Epsilon Data Management, Inc., a database marketing firm in Burlington, Mass. “You still have to have good products, but the message about your products is going to have to be tailored to the individual.”

That means creating a corporate database full of details about the buying habits of those individual customers and prospects, according to marketing experts, who call this trend-setting application “database marketing.”

“You'd better know your customers and prospects so you can communicate one-to-one and have a back-and-forth dialogue,” Drummond says.

On a more tangible level, database marketing requires a firm to extract key data from its own operational databases and then add a layer of demographic, financial and lifestyle data obtained from outside information brokers. The database may reside on a mainframe with database management software, on a dedicated database machine or on compact discs in a desktop computer system.

Database marketing projects must also bridge the traditional gulf between the information systems and marketing departments. Having the IS department involved in the database marketing project is absolutely critical to its success, according to Andrew Deutch, senior consultant at David Shepard Associates, Inc. in Dix Hills, N.Y., a database marketing consulting firm.

Ideally, the IS department is represented on the project's task force from the very beginning, offering advice on product selection, systems capacity, ongoing support and software customization, Deutch says.

The marketing applications for such a database — really a corporate asset — are numerous and varied. Companies are already using the strategy to produce highly targeted direct-mail and telemarketing programs, customized catalogs and newsletters, as well as special coupons and promotions.

Car dealers, for example, can use a marketing database to find out whether you fit the sports car or minivan lifestyle, the type and age of the car you

Continued on page 64

Study finds cost reduction drives IS spending

BY SALLY CUSACK
CW STAFF

Corporate cost reduction, not business strategy, is the prime motivator driving information systems' spending, according to a recent study by The Diebold Group, Inc.

More than 100 IS executives were surveyed by the New York-based management consulting firm to determine overall investment justification practices. Findings indicated that information technology continues to be treated as an expense or resource for supporting individual company operations.

According to Anthony DiRomualdo, director of the study, “The point is, institutionally speaking, existing cost accounting systems within companies are finance-oriented and weren't designed for evaluating intangible components of information technology.”

Ron Bell/Picture Group

CSX's *Cooper has three-pronged approach*

“That seems right on target,” observed Jack Cooper, president of CSX Technology, Inc. in Jacksonville, Fla., the IS unit of transportation giant CSX Corp. “It's an unfortunate scenario, but it exists.”

Aggregate numbers bubble up for the chief financial officer to analyze, DiRomualdo said, but typical numbers, such as the ratio of IS expenditure to sales, can be misleading. IS budgets are usually dictated by an existing cost formula, creating a cost-focused perspective as opposed to a strategic one, he added.

Dan Cavanagh, vice-president of IS at Metropolitan Life Insurance Co. in New York, admitted that explaining information technology products to financial officers is difficult, but he said he feels that people are paying more attention to cost-effectiveness, not cost-reduction, as the bottom line.

While there is an increasing appreciation of the cost-reduction vs. strategy problems, DiRomualdo advocated a proactive stance on the part of the IS manager. “Information systems executives and line managers must work together to determine and document agreed-upon values and quantification methods,” he said.

To that effect, Cooper uses a three-pronged approach by presenting his company's financial department with financially defined productivity gains resulting from automation; detailed costs in terms of realizing competitive advantage; and quantifiable market penetration results derived from industry restructuring programs.

EXECUTIVE TRACK

Sheri A. McFarlane was recently named director of the **U.S. Farmers Home Administration's** (FHA) management systems division in Washington, D.C.

McFarlane is responsible for providing automated support to more than 2,000 FHA field offices, implementing the agency's new Oracle Systems Corp. relational database and overseeing other initiatives in local-area network technology and standardized software development.

McFarlane was formerly director of the information systems technology and planning department at the U.S. Navy Regional Data Automation Center in Pearl Harbor, Hawaii.

A Washington, D.C., native, McFarlane holds a bachelor's degree in business administration from the University of Maryland.

....

James Wegmann has been named to the newly created post of senior vice-president of corporate electronic data processing systems at **Talman Home Federal Savings & Loan Association** in Chicago.

Formerly a vice-president reporting to a senior vice-president of administration, Wegmann, 39, will report directly to the president of Talman's.

A five-year veteran at the landmark Chicago savings institution, Wegmann received his new title in January following his supervision of a major overhaul of Talman's distribution architecture and software applications.

....

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Romancing

CONTINUED FROM PAGE 63

own and, based on past habits, predict when you will be back in the market for a trade-in.

"Rather than the shotgun approach, they can use much more of a rifle approach to identifying high-potential prospects," says Phil Dover, associate professor of marketing at Babson College in Wellesley, Mass.

Eventually, retailers may copy the airlines' frequent-flier programs and offer "frequent-buyer" programs that recognize customers whose purchases are recorded by point-of-sale scanners, says Robert Jackson, director of database marketing at May & Speh, Inc., a service bureau in Downers Grove, Ill.

The trick is to keep the relationship with each customer going from diapers to death, Jackson says.

The concept has been widely adopted in the highly competitive financial-services industry. Bank of America in San Francisco has a database machine from Los Angeles-based Teradata Corp. loaded with about 70G bytes of customer data for market analysis, according to Gene Wycoff, the bank's vice-president of corporate MIS.

The Corporate Data Store, as the system is called, has customer data extracted from bank card, checking and savings accounts. It is mostly used to determine which customers are the best prospects for a new banking service or product and what characteristics the products should have.

The system's payoff, according to Wycoff, is "the ability to increase your level of confidence in going out into a new market." In the past, new products were test-marketed for a period of six to 24 months before the bank felt confident enough for a full-scale launch. "Now, we're able to reduce that lead time substantially and enjoy the benefits of the full revenue stream much earlier," Wycoff says.

> THE CORPORATE Data Store's payoff is "the ability to increase your level of confidence in going out into a new market."
>
> GENE WYCOFF
> BANK OF AMERICA

The following are examples of applications in other industries:

- General Foods USA mails a four-color magazine to households with children age four to 14 that are listed in its database. The magazine includes special coupons, customized by household.
- Cabela's, Inc., a catalog company in Sidney, Neb., uses its database of customer buying habits to determine which customers should get the hunting catalog and which ones should get the fishing catalog, for example. "This is a trend with catalogers because we are all faced with major increases in postage rates" and need to cut down on misdirected catalogs, says Sharon Robinson, Cabela's marketing director.
- Magazines such as *Time* and *Farm Journal* are using "selective binding" technology to produce targeted versions of their publications [CW, Sept. 4, 1989].
- Pinpoint Information Corp., Chantilly,

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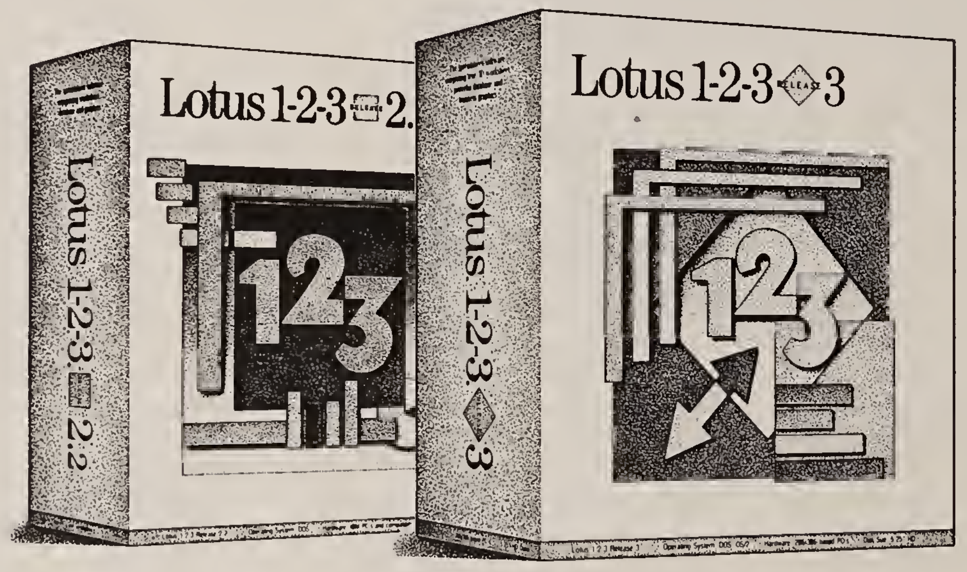

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Federal Government's Information Systems Conference and Exposition. Washington, D.C., March 19-22 — Contact: National Trade Production, Alexandria, Va. (703) 683-8500.

NCGA '90. Anaheim, Calif., March 19-22 — Contact: National Computer Graphics Association, Fairfax, Va. (703) 698-9600.

Marketing the IS Organization Internally. Los Angeles, March 20-21 — Contact: Ouellette and Associates, Bedford, N.H. (603) 623-7373.

Mid-lantic Electronics Show. King of Prussia, Pa., March 20-21 — Contact: Judith Ginsberg, Lafayette Hill, Pa. (215) 828-2271.

CASE World Conference and Exposition. Los Angeles, March 20-22 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Southcon '90. Orlando, Fla., March 20-22 — Contact: Southcon, Los Angeles, Calif. (213) 215-3976.

Association for Computing Machinery Computer Center Management Symposium. St. Louis, March 21-23 — Contact: Larry Westermeyer, University of Missouri, St. Louis, Mo. (314) 553-6000.

Va., is producing fax-delivered newsletters in which the story selection, length and order are automatically determined by the subscriber's profile.

- Arby's, Inc. in Atlanta, has a geographic information system loaded with demographic and lifestyle data, according to Hal Reid, vice-president of franchise planning. It can be used not only to determine where to place a new fast-food outlet but also to make marketing decisions about coupons, advertising and store features.

"I don't know of an industry today, including a traditional industry like steel production, where database marketing can't make a significant difference in competitive positioning," says Thom Blischok, head of industry consulting at Teradata. "To know the customer better than your competition does is a very, very powerful tool."

However, this is not an easy task. Experts say it often takes wrenching cultural changes for a corporation to pull together data from several far-flung departments and maintain the customer database with timely information. "The bigger the organization — the more divisions, the more layers — the bigger the challenge," says Bill Davis, president of Database Marketing Corp. in Burlington, Mass., a direct-marketing agency.

Furthermore, the projects tend to be costly and have slow paybacks. Consultants say it would be hard to justify a full-scale marketing database for a single application, such as selling shaving cream. However, creating a corporate database that helps the company stay close to its customers and prospects over a long period of time and over multiple products is justified as the key to corporate survival.

So, where do you get all of the data to populate the database? Experts say that about 60% comes from the companies' own databases, scattered in such places as the customer-service and billing departments. Even data on customer complaints can be used to identify people who would welcome an improved product.

Next comes "data enhancement," in which information services and service bureaus can overlay company data with lifestyle data collected from sources such as new car registrations, magazine subscriptions, the U.S. Postal Service's change-of-address file, credit-card records and surveys at the bottom of warranty registration cards.

For example, Denver-based National Demographics & Lifestyles, Inc. has a consumer list with 23 million names. Claritas Corp. in Alexandria, Va., breaks the country down into 40 lifestyle clusters, from "Golden Ponds" to "Shotguns and Pickups," and then determines which profile fits a nine-digit ZIP code area (containing an average of six households).

The Direct Marketing Association, which is keenly aware that collecting all of this data about individuals could be considered an invasion of privacy, allows consumers to have their names removed from mailing lists. Also, marketers must comply with the Fair Credit Reporting Act, a federal law protecting the privacy of personal credit reports.

Experts say the already overwhelming amount of consumer information will only increase as point-of-sale data is added to the heap. Citicorp POS Information Services, Inc. in New York is developing a massive database that will track the grocery-shopping habits of as many as 50 million households [CW, Jan. 15].

Corporations can also do some of their own data enhancement by dreaming up surveys, contests, giveaways and other promotions whose real purpose is to obtain data about customers and competitor's customers for the marketing database, experts say.

Database blueprint

The following is a composite of advice from various consultants, users and vendors on how to get started in database marketing.

- Have a businesswide commitment to information-based marketing strategies, not just a fancy mailing list. The project will require a top-management sponsor or champion to get it off the ground.
- Decide what you want the marketing database to accomplish, such as the kinds of questions you want it to answer about consumers and prospects.
- Decide what data is needed to accomplish the mission and how timely it must be. (You want age, sex and buying habits, but you probably don't need to know which customers have blue eyes.) Find out what data already exists from internal sources.
- Work with the information systems department to determine what the hardware and software environments as well as capacity constraints will be. Set up an information system that will integrate the data from in-house systems into a single database and then provide easy access to the data.
- You may want to start with a pilot project to prove the concept works. Decide whether to do it all in-house or obtain outside help from a service bureau.
- Enhance the in-house data with demographic, financial and lifestyle information from external sources and customer surveys.
- Analyze the data to model customer behavior. Formulate targeted marketing programs to exploit the relevant data. "Cherry-pick" the best of the prospects.
- Keep the database up-to-date to maintain a continuing relationship with customers.

MITCH BETTS

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BOOK REVIEW

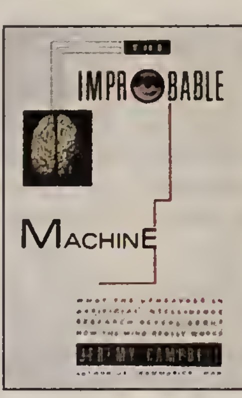
Tracking down the elusive specter of artificial intelligence

THE IMPROBABLE MACHINE
By Jeremy Campbell
Simon and Schuster, $19.95

In his book *The Improbable Machine,* Jeremy Campbell compares the impact of the computer to that of Galileo's telescope on the collected knowledge of man: Both uprooted ideas about intelligence that had stood for hundreds of years. As he puts it, "Galileo's telescope, by providing artificial vision, showed how easy it is to be deceived by looking at the world with the unaided eye. The computer, the basis of artificial intelligence, has unmasked as comfortable delusions our long-standing ideas about the nature of human reason."

This, Campbell states, was demonstrated early on in the search for an intelligent computer when the U.S. Department of Defense funded a project to build a "translation machine" for scientific journals written in Russian. The scientists working on the project soon discovered that a sentence that would be easily understood by a person was totally vague and completely unintelligible to a digital machine with a processing ability based on pure logic.

A human being lives with language every day and can draw reasonable conclusions from relatively incomplete information. A computer has no such ability. Campbell shows that this was far from the last such problem to be encountered.



Expert systems, artificial intelligence, fuzzy logic, neural computers: These terms for machines and software that are intended to have — or at least mimic — human intelligence are slowly working their way into the realm of business computing. No longer is AI a realm dominated solely by the academic.

The Improbable Machine explores why this occurred. Thirty or 40 years ago, it was assumed by many that it would be an easy task to produce a machine that would think like a human being. The crudest computers were being used to decipher complex codes and perform mathematical calculations with an aptitude beyond the most brilliant human mathematicians. Surely, if these machines could do so easily what humans found so grindingly difficult, they should also be capable of doing the "easy" things that people encounter every day, such as decision-making and interpretation. Yet of all the areas of computer technology, AI is the one that has been left behind in the wake of the industry's amazing technical advances.

Campbell says he believes that much of the problem may have resulted from concentrating too much on what the human mind does poorly, rather than realizing the power and complexity of what a mind can do well. *The Improbable Machine* attempts to give a history of AI as well as some insight into the problems its proponents have faced in the past and are trying to overcome today.

Campbell uncovers and illustrates the traps and shortcomings of traditional systems that AI developers have stumbled into. One notable example is a seemingly innocuous question: "Can crocodiles run steeplechases?" To a thinking person, the answer seems an obvious "no." We immediately associate our knowledge of steeplechases with our knowledge of crocodiles; a standard serial computer would have to go through numerous comparisons until a logical contradiction was found.

Campbell goes on to discuss the recent trend toward "neural computers" or "connectionist" systems. Information is fed into these systems and allowed to "settle" into a pattern. Such computers can then generalize about subsequent inputs in terms of how they compare with the previously stored patterns and are therefore not restricted to the exactness required by a serial computer.

Campbell's book is flavored with psychology, logic, philosophy and technology — and not unnecessarily, as all of these subjects play a role in the pursuit of true machine intelligence. While he is often forced to include what may be unfamiliar concepts to the average reader, he is very adept at reducing some very complex ideas into terms and examples that make the material much less of a chore than might first be assumed.

If there is any flaw with the book, it is that one sometimes gets the feeling that one has read parts of the book someplace before. It isn't deja vu; it's that Campbell seems so intent on driving some points home that he repeats them — often.

Because of this, the flow of the book is very gradual. Moving from chapter to chapter is an evolutionary change not unlike the process Campbell describes as making our brain "worldly," as opposed to naive computers.

Campbell gives the reader a good feeling for the complexity and mystery of the human mind by showing what it is not. At least for the moment, it is certainly not replaceable by a machine.

CHRISTOPHER LINDQUIST

Lindquist is a *Computerworld* copy editor.

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DBMS

Next wave could be an easier ride

BY TED RYBECK

From the hierarchical structure in the 1960s to the network model in the '70s to the relational model in the 1980s, database management system developments have yielded benefits for users — but not without a price.

During the 1970s, users invested in systems such as Cullinet Software, Inc.'s IDMS, whereas before the DBMS of choice had been IBM's IMS. When relational products were introduced in the 1980s, their technology departed completely from the two earlier models.

Because the technology involved in the hierarchical and network models could not be extended to this new relational model, users lost the investment they had made in time as well as technology. Given this history, it would be perfectly understandable if users were a apprehensive that a shift toward object-oriented DBMSs might jeopardize the future of their investments in relational technology.

In this case, however, most users can get the gain without the pain — with a little forethought and selectivity.

Object orientation does not have to be a replacement for relational DBMS. As its name implies, it is an orientation rather than a full-blown DBMS model. As such, it can blend with and build on the relational schema.

There are no strict rules preventing a relational database management systems vendor from enhancing its product to become an object-oriented DBMS; in fact, many of them are now doing just that.

So, instead of a full-fledged rebuild of the kind that accompanied the evolution to RDBMSs, at least this time there will be the option of choosing a smooth and natural glide to the next plateau.

Of course, that assumes object orientation has something real to offer — something that warrants a second look for those who have made the transition or are considering the transition to an RDBMS. In other words, why bother?

First of all, object-oriented DBMSs integrate a variety of real-world data types — such as business procedures and policies, graphics, pictures, voice and annotated text. Although these data types need to be managed in today's business world, current relational products are not equipped to handle them efficiently. Data types in RDBMSs are more commonly record-oriented and expressed in numbers and text.

Object orientation also makes a contribution to application development efficiency. It makes the data functions, attributes and relationships an integral part of the objects, just as human attributes are a part of the DNA molecule. In this way, objects can be reused and replicated.

Since the object-oriented approach views and treats not only the data but also the role of the data (see story page 72), you can query the data on its functions, attributes and relationships.

By contrast, most RDBMSs demand that the knowledge associated with the data be written into and maintained separately in each application program.

Assuming that those features sound enticing, the real trick to making sure you don't buy more change than you want is recognizing that object orientation is basically going to be available in two forms: one for those who need and want a radical change and one for those who want some of its advantages without going through a major conversion.

Josef Gast

INSIDE

Going it Alone
4GLs shake off exclusive ties with their DBMSs.
Page 73.

Buyers' Scorecard
In a user survey of RDBMSs, Sybase comes out on top.
Page 77.

Heaven's Gate
How many miles before we reach true distributed?
Page 78.

Purists vs. nonpurists

Object-oriented vendors basically divide into two types: "purists," who design their databases from the bottom up to store data in objects, and "nonpurists," who begin with an RDBMS and then integrate object-management capabilities.

The first troop of object-oriented DBMS purists entered the market in late 1987. Led by Servio Logic Corp., Ontologics, Inc., Graphael, Inc. and Symbolics, Inc. these companies focused largely on the computer-aided design (CAD) market, which needed to store complex data types such as the graphics involved with an aircraft's design.

A second generation — led by Object Design, Inc., Objectivity, Inc. and Object-Sciences Corp. — is expected to emerge by the end of 1990. These companies will enter the arena with the advantage of a standard programming language (C++) and a market already defined by the first generation of firms — CAD — as well as computer-aided software engineering (CASE) and computer-aided publishing.

While total object-oriented DBMS revenues were $5 million for the first-generation purists, it is estimated that that figure will double in 1990 for first- and second-generation firms combined.

Products from the object-oriented DBMS purists will share the following four characteristics in the early 1990s:

- Highly interactive performance for graphics-oriented design applications that exceeds

---

Rybeck is an industry analyst at Advanced Manufacturing Research, Inc., a Cambridge, Mass.-based market research firm.

Next wave

FROM PREVIOUS PAGE

that of the proprietary design databases traditionally handling such applications.

- Concurrency and version-control capabilities to support team-driven development efforts.
- Functionality in multivendor workstation and high-end personal computer environments.
- Data manipulation languages that are based on a subset of C++.

Second-generation object-oriented DBMSs are still in the testing stage. Eastman Kodak Co.'s Advanced Development Division is experimenting with one from Object Design for use in its computer-aided printing and publishing ventures. The company is working only with the schema editor that defines its objects; the actual database is to be delivered later this year.

> THE REAL TRICK to making sure you don't buy more change than you want is recognizing that object orientation is basically going to be available in two forms.

Kodak's director of the project, Bob Gordon, sees great potential for the object-oriented DBMS. "If you're trying to put out a newspaper, you have to manage pages that are made up of different-size articles, pictures, graphics, ads, etc. You want an object-oriented database that can manage all of them and let you pass some of the attributes of one down to another," he says. "Relational databases don't handle very large and very small objects of the same data type efficiently, and they make it difficult to have inheritance between objects."

Mix and match

The nonpurist group is made up of the leading RDBMS vendors. These organizations support the concept of integrating object-management capabilities with their current line of relational products. Although most vendors are still busy in their research and development laboratories, some products have begun to emerge.

Sybase, Inc. became the first RDBMS vendor to introduce anything related to an object-oriented capability with the 1987 release of its RDBMS.

Sybase enables the user to program a limited number of business procedures along with the data types in a server's database engine. Any client attempting a transaction that does not conform to these procedures is simply rejected by the database.

That capability enables users to shorten the development cycle, since integrity logic and business rules no longer need to be programmed into each application.

This approach reduces maintenance costs as well since any changes in the procedures can be made once at the server level instead of several times within all the affected applications.

Lastly, the server-level procedures increase the system's performance, since the operations are taking place closer to where the data is actually stored.

Innovative users took advantage of Sybase as the relational basis for their own object-oriented applications. Chevron Corp., for example, chose Sybase in 1988 as the relational foundation for an internally developed object-oriented DBMS.

A Chevron R&D group is developing the DBMS as part of its new generation of process control and monitoring information systems that operate the company's refineries, chemical plants and pipelines. Upon completion, the DBMS will integrate the status and control data for the various operations and procedures that need to be triggered if an emergency occurs.

Chevron handles the actual object-management functions of the system through an internally developed hierarchical DBMS that links into Sybase.

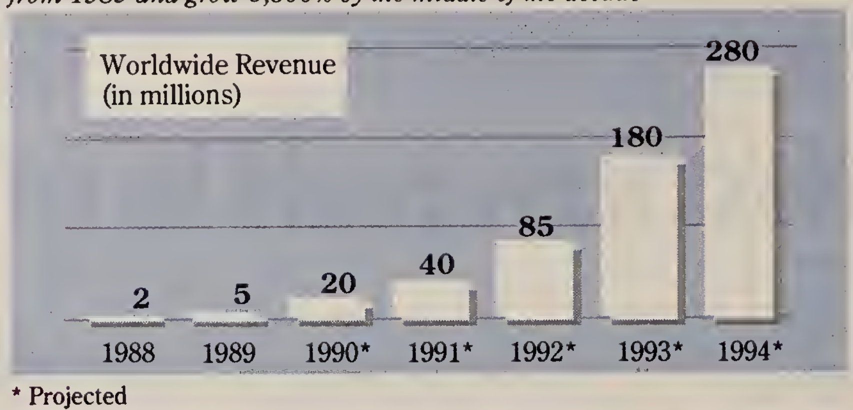
While the hierarchical portion of the system provides 100 times faster responses than Sybase, Chevron would still prefer to define the system's objects within the relational tables themselves if Sybase offered that capability.

"Sybase isn't all we want, but it's a lot better than anything else we could find when we looked on the market," says Art McCready, the project's lead engineer. "We're hoping that by the time we start building the next-generation system in 2000, we'll find off-the-shelf packages to take over most of the work we had to do ourselves this time."

In November 1989, Ingres Corp. made a move toward an object-oriented DBMS with its Release 6.3, which it called the Intelligent Database. Almost a year earlier, Ingres delivered a free Release 6.0 upgrade to all Ingres 5.0 users as the foundation for an array of object-oriented capabilities that would be expanded.

Impressive strides

Object-oriented DBMSs are expected to quadruple in revenue this year from 1989 and grow 5,500% by the middle of the decade



* Projected

Source: International Data Corp.

CW Chart: Doreen Dahle

Eventually, the company plans to build a full set of object-management capabilities around its proprietary fourth-generation language, ABF. For now, however, it offers two sets of new features.

The first allows server-level procedure definition. The difference between this approach and Sybase's method is that the former allows a rule to trigger itself or other rules as many times as necessary, whereas the Sybase rules can trigger only once. The other new capability allows the user to define new data types that are outside the conventional numbers and text.

Using another petroleum-related example, the two new features would allow an RDBMS to trigger the instructions for handling an oil spill depending on a user-defined data type such as latitude and longitude. This could have been accomplished with the former release by writing separate application programs at the client level. But this server-level approach offers an expansion of the benefits from Sybase: reduced development time, reduced maintenance costs and improved performance.

Oracle reports that it will eventually support a smooth transition to an object-oriented DBMS capability in the next few years by enhancing its data manipulation language to handle objects. To date, however, the company has no object-management capabilities.

As for the Sybase and Ingres features, Oracle rejects the notion that they represent a significant step toward an object-oriented DBMS.

Object-oriented DBMS purists consider all these RDBMS approaches incomplete, but they welcome the attention.

"We thought Oracle, Ingres and Sybase might pooh-pooh objects, but they've validated the market by embracing them," says Tom Atwood, president of Object Design.

However, E. F. Codd, who originated the relational model at IBM, criticizes the purists and nonpurists alike for sacrificing long-term dependability for short-term product release by neglecting to develop a mathematical base.

"If you build things without a theoretical foundation," Codd explains, "then it's rather like saying that I want to build the Verrazano bridge even though my only knowledge of bridge building is putting a plank across a stream. Object orientation needs a mathematical discipline to underlie its work — just as civil engineering is the discipline for bridge building. Otherwise, you could cause the bridge, or a company's database, to be washed away."

Individual firms as well as standards organizations are attempting to answer Codd's criticism with formal proofs to ensure that an object-oriented DBMS implementation is robust enough to last.

Demand on the rise

Despite the lack of a rigorous object-oriented DBMS standard, the demand for object-oriented products of both the purist and nonpurist varieties will increase. Object-oriented purists will answer the needs of the CAD market as well as users who have been unable to benefit from RDBMS products because of needing to manage data outside the realm of numbers and text.

For most segments of the DBMS market, however, the RDBMS vendors will suffice.

> "SYBASE ISN'T all we want, but it's a lot better than anything else we could find when we looked on the market."
>
> ART MCCREADY
> CHEVRON

The object-oriented purist capabilities of integrating complex data types such as pictures and voice are useful, but for many users, they are reminiscent of the videophone technology enthusiastically discussed in the 1960s. Although the capability was universally attractive, the technology has been slow to move beyond the niche market for teleconferencing because it was not an essential need.

Nevertheless, the RDBMS vendors will have to make sure that their offerings can match the increased demand for capabilities as users recognize some of the broader-based benefits of an object-oriented DBMS. A sure challenge for the RDBMS vendors will be the natural tendency to protect an installed base of technology. As the old line goes, if all you've got is a storehouse of hammers, everything begins to look like a nail.

IBM's resistance to implementing its own research on relational technology from the 1970s is the classic case of

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PARAMETER DRIVEN SOFTWARE, INC.: You can use operation statements on Report Screen 2 to load the printer escape sequences into L-values. Define conditional logic statements that determine under which conditions the field will be printed. That means, load "1" into the numeric variable for the tab position of the L-value if the field will be printed, or load "0" if the field won't be printed. On Report Screen 6, define the L-value that contains the appropriate escape sequence in the FIELD column. In the TAB POS column, load the K-value (from above) that controls the tab position.

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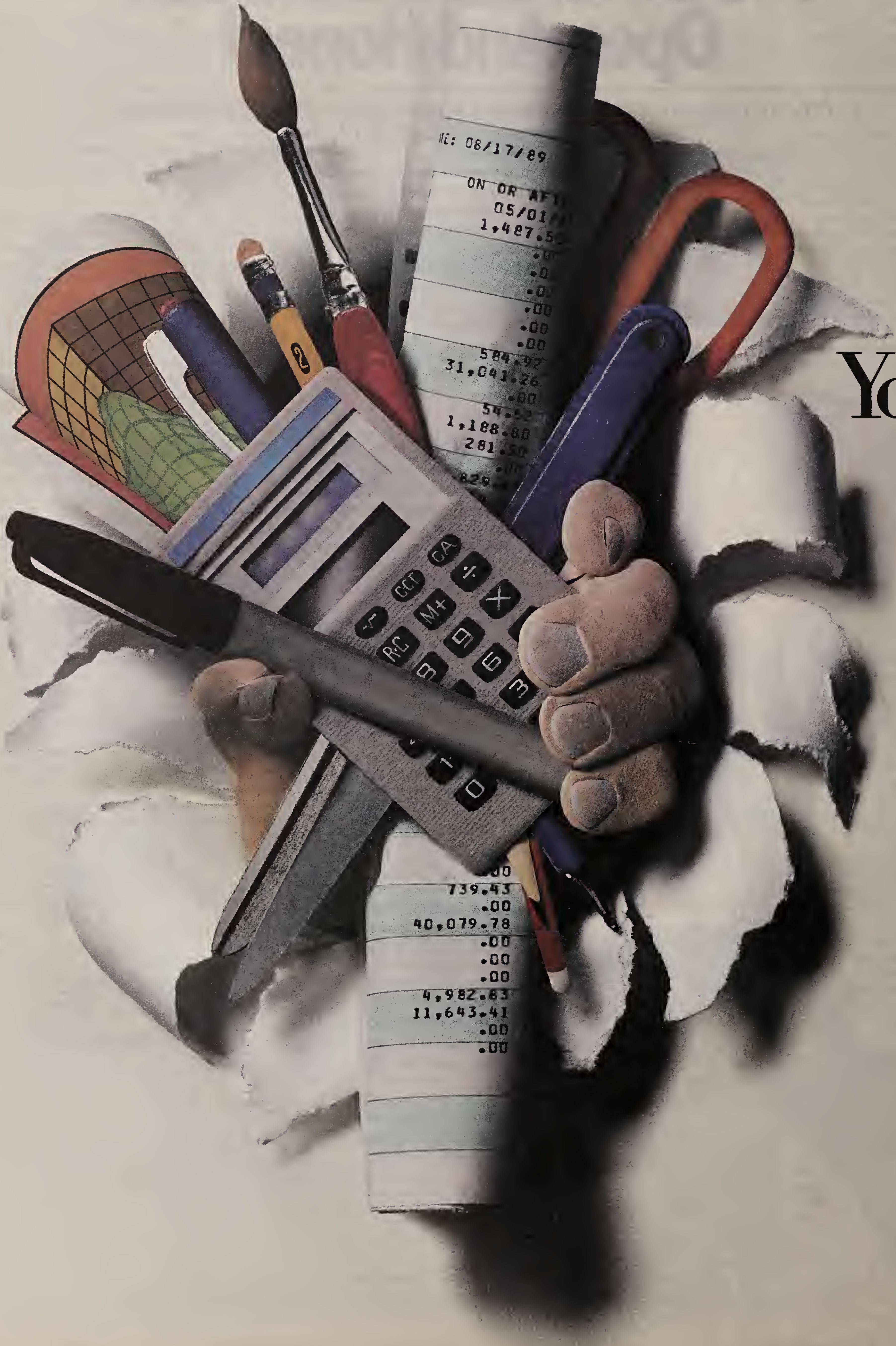
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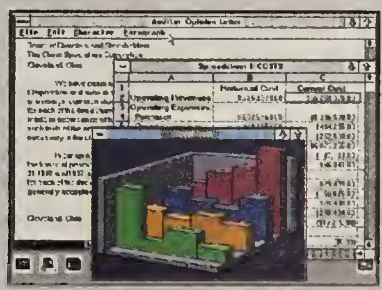

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protecting an installed base. Since customers were already entrenched in IMS, IBM chose to wait until the mid-1980s before aggressively selling its RDBMS products. Meanwhile, an entire RDBMS industry had been built up by Oracle, Ingres, Informix and other firms that had read IBM's published articles.

An advantage for the RDBMS vendors is the 10 years of experience they have had developing the features that users require from any DBMS.

In contrast, the "object purists" need to write all the code to handle basic issues, including security, data integrity, fault tolerance, interoperability among different databases, portability of the database to various hardware platforms and a client/server architecture that accommodates distributed computing. Though armed with efficient object-oriented languages, these vendors have a ways to go.

Professor Michael Stonebraker, a founder of Ingres and professor of computer science at the University of California at Berkeley, is confident that the RDBMS vendors that are seriously committed to developing an object-oriented DBMS will meet the challenge.

Racing for the finish

"It's a horse race to see who gets [to full object-management capability] first," Stonebraker says. "Right now, I'll give you very long odds on the existing RDBMS vendors. They're very hungry, very competitive, very smart and have 20 times the resources of the" purists.

Many users — still preoccupied with new applications for RDBMS technology — concur: "We expect Oracle to make the object-oriented capability available before we have decided how to effectively apply it," says Bob Easterling, director of computer-integrated manufacturing at Cummins Engine Co. The success of either group of vendors will depend on their ability to market products based on the benefits to the user instead of their technology.

"Users are going to be very reluctant to change what's already in place unless an object-oriented vendor stops speaking computerese long enough to say what people have to gain," says Ronland Crum, a Boeing Computer Services consultant.

In the meantime, users are faced with both an opportunity and some tough decisions when considering an object-oriented DBMS. To take advantage of these new capabilities, they will have to answer three questions:

- What are the DBMS' capabilities that we will need to gain a competitive advantage through our information systems strategy?
- What organizational changes need to be made to take fullest advantage of the end-user empowering, object-oriented technologies?
- Are we partnering with a DBMS vendor that has the technology, complementary software and strategy orientation to meet our needs throughout the 1990s?

As the evolution toward an object-oriented DBMS continues, it is important for users and vendors to remember that only the fittest survive. The lesson of the transition from the network model to the relational model will apply as much as ever.

"Those who were caught flat-footed, became complacent or didn't move with the technical times got buried," Stonebraker says. •

From the vine

What's an illustration of an object-oriented DBMS object? Think of the Fruit of the Loom television commercials.

Remember the person inside the stem of grapes? Like any grape, he has functions in a lunch box or a punch bowl; he also has color variations between his skin and his stem and multiple relationships to other fruits.

The difference in this grape's case is that you can query him about any of these functions, attributes or relationships, and he will answer all your questions. You can also give him additional information, such as the recipe for how to make himself into a fine wine, and he will be capable of holding onto the recipe and even acting on it. That's called encapsulation.

Inheritance gives the object-oriented DBMS user an ability that even the Fruit of the Loom grape lacks. With an object-oriented DBMS, the user can replicate the grape with all its functions, attributes and relationships intact. Therefore, the grape can be reused under different circumstances and modified as necessary. Since many objects are almost the same except for slight variations, inheritance enables the DBMS developer to replicate the characteristics of one object to form another.

For example, many of the qualities of a grape would be passed down to any of the juice that is made from it. A new object, "grape juice," could therefore be developed by simply adding the new information.

"Multiple inheritance" extends the concept further so that a new object could be created by combining the characteristics of multiple "parents" — as in the case of "grape soda."

TED RYBECK

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DA30WC

4GLs, bundled or a la carte

BY GARY ROBINS

For Jim Newman, second vice-president at American National Bank & Trust Co. in Chicago, selecting a database management system three years ago was straightforward. Since the bank had decided on Ideal (now CA-Ideal) for application development, there was no question what the DBMS would be. At the time, Ideal ran only with Datacom/DB (now CA-Datacom/DB).

Last year, Gary Sarkesian, manager of production distribution systems at Scott Foresman & Co., faced the opposite situation. When he settled on Natural as an application development tool, he did not even consider Adabas, its native DBMS. Since his company was an IBM DB2 site, his main concern was finding a fourth-generation language (4GL) that interfaced well with that environment.

Although 4GLs in the past were designed to work with a single DBMS, a growing trend is for vendors to split off the 4GL from the DBMS, according to Jeff Tash at Database Decisions, a Boston-based education and consulting division of Hewitt Associates.

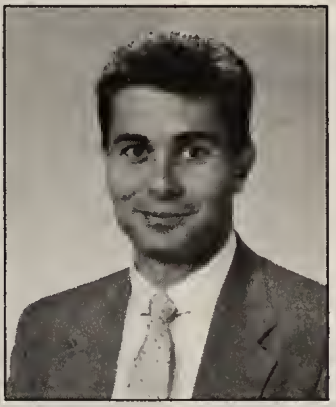
It seems the jury is still out on the advantages of this newfound flexibility. In a recent *Computerworld* survey, 68% of 425 users of relational DBMSs on large and medium-size platforms reported that they primarily use development tools provided by their DBMS vendor. Only 16% primarily use tools supplied by other vendors. Another 34% mainly use in-house tools.

Even though he would have more options today on a 4GL, Newman says, "I'm not sure our decision would be any different."

On the other hand, Sarkesian says other factors outweigh the 4GL's importance, such as the size of the shop, the size of the hardware and whether the environment is a multivendor one when deciding on a database purchase.

Sarkesian speculates on whether the 4GL would run better with its native DBMS. "When Natural talks to DB2, it has to translate to SQL. With Adabas, it would not have to go through a translation factor," he says. The trade-off — DB2's capabilities for Adabas' strong tool set — he says, is worth it, since the performance difference is not noticeable during day-to-day operations.

On the whole, observers agree that the bundled option is the safer bet. "If you had to buy a product today, the best thing you could do to build applications would be to buy a bundled solution," Tash says.


Gary Sarkesian

In the large systems world, however, the answer is more likely based on whether the DBMS is from a hardware or software vendor.

"Whereas [IBM's and Digital Equipment Corp.'s] DBMSs are very competitive, the 4GLs they offer are significantly less powerful than third-party alternatives," Tash says.

Especially in DB2's case, says Howard Fosdick at Fosdick Consulting, Inc. in Chicago, the hardware vendors' DBMSs do not offer much in terms of a solid 4GL.

That does not stop people from favoring DB2, however. In fact, DB2's popularity has led some third-party DBMS vendors to unbundle their 4GL products and reposition themselves as 4GL vendors. "The 4GL people now market their systems as application development environments that work with DB2," Fosdick says.

In the midrange arena, however, a different tune is being played. Here, it is generally more common to opt for the bundled DBMS/4GL system. In fact, Tash says that Ingres Corp. and Oracle Corp.'s 4GL products "go a great way in selling the DBMS."

In addition, since many users purchase Oracle and Ingres DBMSs for their portability, they would want the tools to be as portable as well, says Colin White, president of Database Associates in Morgan Hill, Calif.

Nevertheless, vendors are starting to offer 4GLs to operate with these third-party DBMSs. Whether a manager takes this option depends on the capabilities of the tools at hand, White says. Very often, it is an individual's preference that dictates the decision, such as which user interface is preferred.

Be it a large or midrange system, "The question is, do the tools do what you want them to do?" White says.

A lot of that depends on whether the 4GL will be used for transaction-heavy production applications that require subsecond response time or more interactive decision support, according to William Inmon, a senior principal at American Management Systems, Inc. in Lakewood, Colo. "If you are talking about a classical operational database management system, then it makes sense to buy whatever comes integrated with the package," he says. "If you are going to be doing decision-support processing, then you can have an open mind."

At South Carolina Electric & Gas, two different 4GLs are used to suit both environments. Debra Ready, a senior systems programmer/analyst at the firm, is a long-term user of IDMS (now CA-IDMS/DB) and its native 4GL, ADS (now CA-ADS). The utility company also runs Focus as a tool for end users.

Ready says the translation between Focus and IDMS is rough.

"The benefit of a separate 4GL is that you can get to other types of data not defined to IDMS," Ready says. "The downside is that I don't care about other data. I care about what's on the database, and the interface on Focus is not as easy as the one that is in ADS."

The decision of whether to stick with a DBMS' native 4GL or shop around will be influenced by vendors' growing willingness to market their 4GLs for the more popular DBMSs. With more 4GL options, a manager's choices will only increase. •

Robins is a free-lance writer based in Northfield, Minn.

No assembly required

Plenty of information systems managers still prefer to buy their 4GL and DBMS as a package from a single vendor.

This is especially true with the wide adoption of SQL as a database access language, which opened up the previously proprietary world that came along with the bundled option.

What was missing was the ability to merge proprietary non-SQL and often nonrelational DBMSs with the new world of relational SQL DBMS and, further, to provide compatible application development tools.

Even IBM with its industry-leading DB2 does not yet offer a strong 4GL. Also, there is nothing easy about the migration path from IBM's IMS to DB2.

Computer Associates International, Inc. has launched the most ambitious attempt to date to answer users' requirements for migrating from old databases and conforming to SQL. The company is migrating the products it acquired from Applied Data Research, Inc. and Cullinet Software, Inc. from proprietary nonrelational structures to relational, SQL-based ones.

The first DBMS to carry out this plan is CA's Datacom/DB Release 8.0, a package that allows data tables to be processed by both SQL and non-SQL functions. In addition, with transparency functions, the database will allow programs written for IBM's IMS to operate on the same data, while providing system and data integrity.

Currently in beta testing at user sites, Datacom/DB is CA's first answer to IBM's DB2 and SQL success story.

"Datacom is very late coming to the SQL game," says Larry Willets, director of software and information management services at International Data Corp. in Washington, D.C. "Because of that, it's almost mandatory that CA try something this ambitious."

Late or not, beta testers such as Mark Demboski, vice-president of technical systems at Tupperware Home Parties MIS group in Orlando, Fla., are pleased with what they see so far.

"This version will allow us to evolve our application from IMS to Datacom and SQL without massive conversion costs," Demboski says.

In addition, he favors Datacom/DB over DB2 because of the integrated package of development tools.

"We haven't found any glaring weaknesses yet," Demboski says. "We knew we'd hit a few bugs, but the basic package appears stable enough to go with a production application."

Another beta-tester, Bob Cancilla, manager of technical support at Fremont Compensation Insurance in Los Angeles, estimates that it would cost his company $2 million in application conversions and $1 million in additional hardware to move from installed database systems designed under a prior version of Datacom/DB to DB2.

Release 8.0 will allow the company to avoid that investment as well as move the applications into SQL.

In addition, Cancilla says the new release fully exploits IBM's MVS/ESA, which the company is in the process of moving to, and offers performance enhancements. Still, if CA had chosen to not include SQL in this latest version, Cancilla would not have been interested in buying Datacom.

"I wouldn't take the risk of going to another technology. SQL is an IBM standard and may eventually be engineered in the hardware," Cancilla says.

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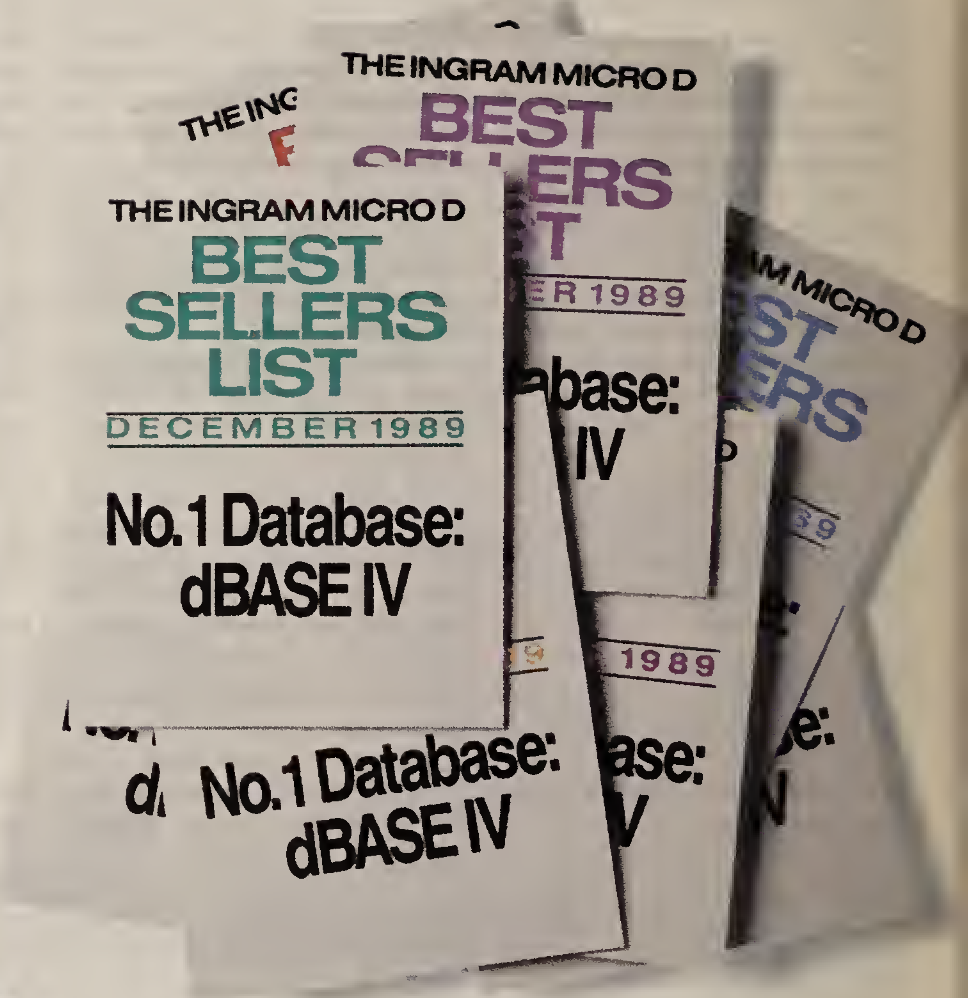

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BUYERS' SCORECARD

Sybase wins by a nose

BY MICHAEL L. SULLIVAN-TRAINOR

Size isn't everything. In a preference test pitting some of the most advanced SQL-based relational database management systems against one another, Sybase, the smallest of the contenders (with about 1,000 nonpersonal computer licenses sold), came out on top in overall user satisfaction.

Users surveyed for *Computerworld's* Buyers' Scorecard gave Sybase 48.5 points overall, less than one single point over Oracle, but 5.5 points ahead of IBM's DB2. These results are based on surveys of more than 400 users rateing only the products they use. Total scores are based on weighted scores combining all criteria (see methodology next page).

Sybase's photo-finish capture of the top slot is attributable to its attaining the highest ratings in eight out of 18 categories ranked by users, including scores of 8.1 for on-line transaction processing performance and 8.5 for useful SQL extensions.

"If you engineer the Sybase server correctly, it's very fast," according to Paul Bagnoli, associate director of MIS at Sanford C. Bernstein & Co. in New York.

Oracle earned top ratings in five categories, as well as the highest rating — 8.6 — for standard SQL support. While Cincom Corp.'s Supra, Digital Equipment Corp.'s RDB and IBM's DB2 and SQL/DS had the highest scores in two categories, Ingres Corp. notched only one lead high score, and Informix Software, Inc. failed to top any category.

Scorecard respondents named advanced features, such as stored procedures and triggers, as the most useful functions of Sybase, which runs only on DEC, Unix and personal computer platforms.

"Stored procedures allow users to do more with the database without involving a programmer," says Hedy Alban, manager of software at Management Information Corp., a Cherry Hill, N.J.-based software analysis organization.

DB2 ranked last in seven of the 18 categories surveyed, followed by IBM's SQL/DS, which rated five lowest scores.

Four of DB2's low ratings, which ranged from 5.3 down to 4, were in migration and advanced features categories, such as providing gateways to other vendors' DBMSs and distributed processing capabilities.

It is important to note, however, that these categories were rated lowest in importance by users. The most important category for users — systems availability and crash recovery — was led by DB2, while Sybase ranked in the middle of the pack.

Given the price/performance gains of running applications on smaller processors, does the strong satisfaction ratings of RDBMSs, which primarily run on minicomputers and workstations, mean that they are ready to take on DB2-size projects? Zealous advocates can be found on both sides of the issue, but the complexity of the mainframe environment makes it difficult to imagine such a migration.

"Sybase has nice features, but there is no way it compares with DB2 in industrial-weight quality," says Chicago-based consultant Richard Finkelstein. "We're talking 100G-byte databases vs. systems running on Sun workstations and VAXs."

Some midrange RDBMSs have performance problems as databases grow larger, says Martin Butler, chairman of Butler Bloor Ltd., a research firm based in Hull, UK, that analyzes the major packages.

"With very large tables that people want to access frequently, there will be performance bottlenecks for Sybase running under VMS," he says.

"It's not as simple as downsizing to a smaller platform," he adds. "DB2, which in truth is not particularly powerful, receives low ratings because people are trying to do more complex things with it. If users tried to implement these kinds of high volumes in Sybase and Oracle, that would lead to dissatisfaction as well."

Sullivan-Trainor is a *Computerworld* senior editor, features.

BUYERS' SCORECARD

Sybase	**48.5**	**Strength:** Advanced RDBMS features **Weakness:** Lack of front-end tools

Sybase wins the user rating based on combined point totals.

Response bases for all charts: DB2 61, SQL/DS 61, Supra 61, Informix 60, RDB 60, Oracle 63, Ingres 64, Sybase 36 (Strengths and weaknesses are based on most frequently stated response)

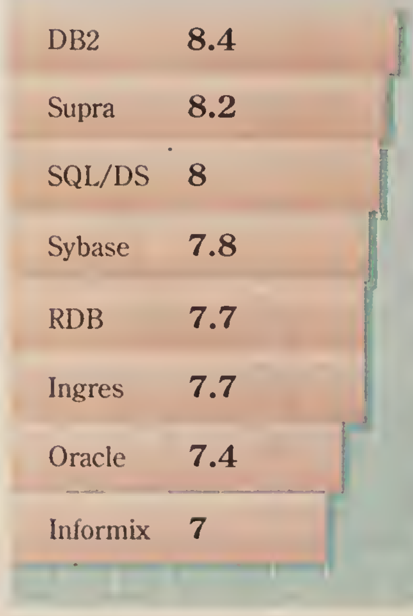
Oracle	**47.6**	**Strength:** Forms generation **Weakness:** Price and support
RDB	**45.6**	**Strength:** Ease of use **Weakness:** Slow response time
Ingres	**45.1**	**Strength:** Screen functions **Weakness:** Performance
Informix	**44.7**	**Strength:** SQL capabilities **Weakness:** Not user-friendly
Supra	**44.7**	**Strength:** On-line maintenance features **Weakness:** Integration with other packages
SQL/DS	**43.6**	**Strength:** Query capabilities **Weakness:** Perfomance
DB2	**43.3**	**Strength:** Data recovery capabilities **Weakness:** Performance

Key ratings

System availability and recovery from crashes

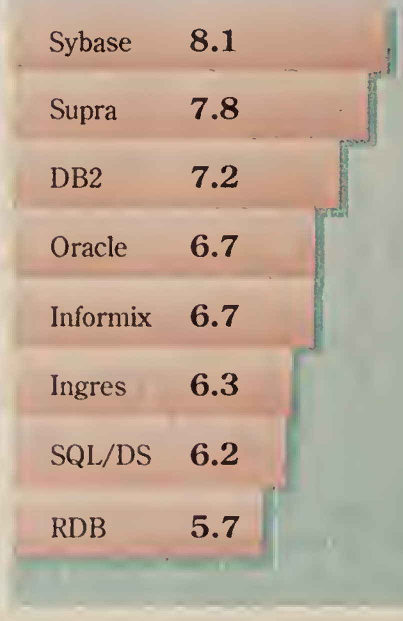
DB2 outranks its rivals in the factor most critical to the respondents, system availability

1 = very poor 10 = very good



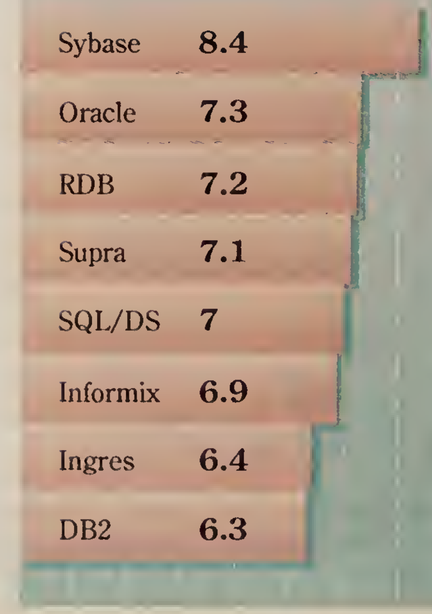
Performance in processing on-line transactions

Sybase's server-based product tops the competition in OLTP



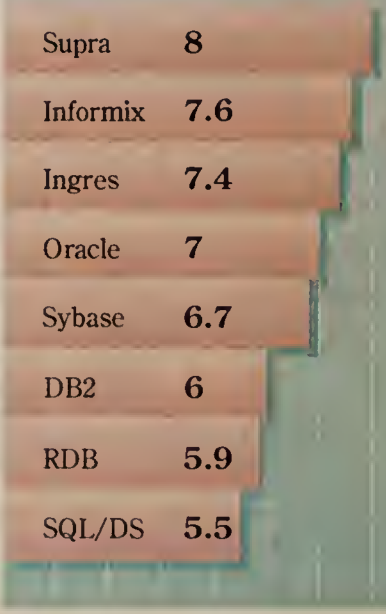
Providing effective user-defined integrity

Sybase leads the pack in user relational database facilities, such as triggers and data types



Providing effective programming tools

Supra users rate their product highest for providing tools such as a fourth-generation language



Loyalties

Would you buy the product again?

(Reasons based on most frequently stated response)

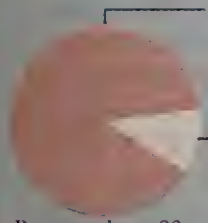
DB2

60 **Likely**
Why: Because it's IBM's product

1 **Not likely**
Why: No response

Response base: 61

Sybase



32 **Likely**
Why: Good performance

4 **Not likely**
Why: Lack of tools

Response base: 36

Oracle

50 **Likely**
Why: Best product on the market

8 **Not likely**
Why: Poor vendor support

Response base: 58

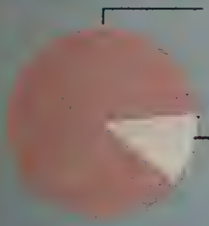
Ingres

54 **Likely**
Why: Product does the job well

9 **Not likely**
Why: Not as good as other products

Response base: 63

Informix



51 **Likely**
Why: Best on the market

7 **Not likely**
Why: Poor performance

Response base: 58

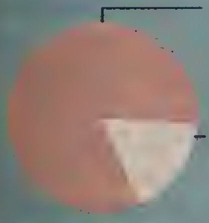
SQL/DS

52 **Likely**
Why: Product meets our needs

7 **Not likely**
Why: Better products are available

Response base: 59

RDB



50 **Likely**
Why: Product works well in our environment

10 **Not likely**
Why: Third-party products are better

Response base: 60

Supra

43 **Likely**
Why: Product never fails

18 **Not likely**
Why: Switching to DB2

Response base: 61

A closer look

Ratings in other key areas clearly show product strengths and weaknesses, such as RDB's security features, Sybase's provision of SQL extensions and Oracle's support of end-user tools. Decision-support performance ratings are a dead heat between IBM and Sybase products, with everyone else not far behind — a far different story than that of the OLTP ratings

✓ Providing effective end-user tools

Oracle	6.4
RDB	6.3
Sybase	6
Ingres	5.9
DB2	5.8
SQL/DS	5.6
Informix	5.3
Supra	4.6

✓ Performance in decision-support applications

Sybase	7
DB2	7
SQL/DS	7
Oracle	6.8
Ingres	6.6
Informix	6.5
Supra	6.4
RDB	6.2

✓ Useful SQL extensions

Sybase	8.5
Oracle	7.9
Informix	7.4
Ingres	6.8
SQL/DS	6.5
DB2	6.3
RDB	6.3
Supra	6

✓ Support of standard SQL

Oracle	8.6
DB2	8.2
Informix	8.2
SQL/DS	8.1
Sybase	7.8
Ingres	7.2
RDB	7.1
Supra	5.8

✓ Multilevel security features

RDB	7.5
Oracle	7.2
Sybase	7
Ingres	6.9
Informix	6.7
SQL/DS	6.7
DB2	6.6
Supra	6.3

✓ Integration of DBMS and operating system security

RDB	8.1
Oracle	7.2
Ingres	6.8
Sybase	6.8
Informix	6.8
Supra	6.5
DB2	6.4
SQL/DS	6.2

✓ Performance and system monitors

Sybase	6.7
Supra	6.6
RDB	6.5
DB2	6.1
Oracle	6.1
Ingres	6.1
Informix	5.9
SQL/DS	5.9

✓ Auditing functions

Oracle	7.2
Ingres	7.2
RDB	6.8
Informix	6.8
Supra	6.2
Sybase	5.9
DB2	5.8
SQL/DS	5.8

METHODOLOGY

Products rated in *Computerworld's* RDBMS Buyers' Scorecard were chosen based on three criteria: they must be relational — that is, have a relational engine, as well as a relational front end; they must be SQL-based; and they must be one of the top products in terms of number of installations on the following platforms: IBM/PCM mainframe, DEC VAX and Unix workstations.

The ratings are based on telephone surveys conducted by First Market Research in Austin, Texas. Lists of users of each product are provided by objective nonvendor sources. The survey respondents are randomly chosen from these lists.

The RDBMS comparison involved phone survey results for a minimum of 60 respondents for each product, with the exception of Sybase, for which the minimum was dropped to 30 respondents because of the small number of users available. The weighted scores were computed by multiplying the mean scores all users assigned to each criterion by the mean scores each user group gave to its own products.

Result tabulation and survey development were performed by IDG Research Services in Framingham, Mass.

ACKNOWLEDGMENTS

Computerworld acknowledges the contributions for this month's Buyers' Scorecard from the following: Hedy Alban, Management Information Corp.; Martin Butler, Butler Bloor Ltd.; Richard Finkelstein, Performance Computing, Inc.; David McGovern, Alternative Technologies; Ronald Ross, Ronald G. Ross Associates; George Schussel, Digital Consulting, Inc.; Jeffery Tash, Database Decisions; Computer Intelligence Corp.; Dataquest/Focus Research Division; Installed Technology International; and International Data Corp.

Distributed is miles away, but the journey has begun

BY CAROLYN GREEN

There is more talk these days of "true" distributed database management systems than there are products to support it. However, that doesn't mean that the only thing going on is idle chatter. While nothing on the market today provides the transparent, seamless processing across heterogeneous environments that true distributed DBMSs promise, vendors are at least taking steps toward providing distributed capability.

There are three basic requirements for a true distributed DBMS environment:

- Users must be able to access data on multiple processors without knowing where the data is located.
- Single tables must be able to be stored on many processors at one time.
- Copies of tables distributed on multiple processors must be synchronized or kept up-to-date with one another at all times.

All of this is supposed to happen transparently, including query requests and transaction processing. Neither the application program nor the user needs to know where the data is located. On true distributed database management systems, operations appear the same to the user as they do in a nondistributed environment.

The greatest challenge in achieving true distributed database support is ensuring that the system will function reliably in a production environment. The DBMS must have the capability to update transactions across multiple sites without committing incomplete transactions or tying servers up in deadlock contention.

This sort of bottleneck occurs when two update procedures are waiting for one another to complete its process.

All up to date

Furthermore, since it is crucial for all databases to be updated at the same time through one transaction, a failure mechanism must be in place in case an update fails. The mechanism undoes — or backs out — an update across the other processors so that it does not get committed to memory.

Because this failure mechanism is so important, each processor in the network must be able to operate independently — backing off from updates if necessary — even if the coordinating or master processor goes down.

While these capabilities will probably not be seen for some time, the top DBMS vendors have made steps toward distributed technology, mainly in the areas of remote query processing, distributed update processing and client/server architecture.

Eyes on the prize

Systems Application Architecture (SAA) is where IBM is concentrating its distributed database capabilities. The organization intends to extend its relational SAA products so that they provide access to distributed relational data through the SQL interface.

Under this approach, DB2, SQL/DS, OS/400 DBMS and OS/2 Extended Edition are all intended to provide remote and distributed processing. While the former allows query and update access to a single remote DBMS, distributed processing allows a program to read and update data from multiple remote DBMSs. Each SQL statement, however, must refer to only one database.

DB2 Version 2, Release 2, which is currently available, represents a first step toward full distributed support. In this version, application programs can read multiple remote DB2 databases, but they are restricted to single database updates. Enhancements expected in the short term include snapshot copy management, connectivity between OS/2 and DB2 and read-only SQL access to DL/2 data.

Oracle Corp., one of the first entrants in the distributed DBMS market, has a strategy to provide distributed DBMS products in a variety of environments, including MVS, VM, DOS, OS/2 and Unix. Since Version 5.1, Oracle has provided transparent distributed query functions via standard SQL syntax and distributed data dictionary support.

In Version 7, scheduled for release later this year, Oracle plans to support updates of multiple-site databases in a single transaction. The two-phase commit protocol will include deadlock detection, which is a manual override to prevent critical servers from being tied up in an incomplete transaction. It will also support such external coordinators as CICS and other teleprocessing monitors.

Oracle has no immediate plans to provide transparent fragmentation support,

---

Green is associate editor of "Data Base Newsletter" in Houston.

ASK THE VENDOR

I have been using PC Manager's image database management system tool kit, PC Album, with an image-capture board, and now I'm interested in the new Video Graphics Array (VGA) capability of these products.

How does the VGA capability work compared with the image-capture ability?

Jan Siemieniewski
Vice-President
S & W Computer Image Security Systems
Riverside, Calif.

PC MANAGER, INC.: The standard image-capture board allows for the capture and display of images, while a VGA board allows only for the display capability.

Using a VGA board is more cost-effective when working in networked environments with multiple workstations or for long-distance viewing via modems, because you can set up just one station with an image-capture board and the other stations with the less expensive VGA boards.

The VGA board can display only 256 colors at once, and thus you may run into a problem when you want to display more than one image. For example, two images could be assigned different palette numbers for the same colors. The palette selected to represent one image will be correct, but once two or more images are displayed at one time, the colors selected for one palette may not correctly represent the colors for each image.

The PC Album overcomes this by allowing the user to palettize multiple images at the same time. It will create a palette that selects colors to satisfy all of the images displayed.

In other words, if color number one is green, the number one will represent green for all images.

We have a Dataease-based application running on a local-area network. Some of our advanced processing exceeds the 640K-byte limit imposed by DOS. Unfortunately, some of our workstations are limited to 640K bytes. How can I resolve this situation?

Fred Taylor
President
Professional Associates Data Systems
Marietta, Ga.

DATAEASE INTERNATIONAL, INC.: Dataease 4.2, an application development system, supports both 640K-byte and extended memory environments.

During installation, Dataease prompts you to install a version that runs within 640K bytes or a version that supports from 1M to 16M bytes of random-access memory. This selection allows you to optimize your processing power and perform the most processing-intensive tasks on the machine capable of supporting extended memory.

Dataease 4.2 supports extended memory on Intel Corp. 80286 and 80386-based personal computers and lets you mix workstations running the 640K- and 16M-byte versions of the application on the same network.

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Vincent Pasqualicchio, Manager of Data/Database Administration, Metropolitan Life Insurance Investment System, and Technology Group, New York City

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DBEXPO90

OUTSTANDING TECHNICAL CONFERENCE
■ "What to Look for in a Relational DBMS" - Chris Date, Codd & Date Int'l.
■ "SQL Standards for Hetrogenous Database Processing" - Dave Dempsey, Tandem Computers
■ "Using DEC Database Products" - John Loether, DEC
■ "Using the IBM Information Repository" - Paul Winsberg, Consultant
■ "A Strategy for CASE Implementation" - Vaughan Merlyn, CASE Research Corp.
■ "Defining an Application Architecture for SAA" - Jeff Tash, Database Decisions

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under which data dispersed across processors can be accessed transparently by users.

Ready, aim, function

Software AG is pointing its products — Adabas, Adanet and Natural — at distributed database functionality. According to the company, it is concerned most with location, fragmentation and replication independence in a DBMS-independent environment. Adabas 5 currently provides remote query and update access; however, these updates are limited to a single database. With the introduction of Adanet, expected by mid-1990, Adabas will be able to provide fragmentation and replication independence, with data integrity ensured by a two-phase commit protocol.

Tell me true

When the experts get together and talk about a true distributed database, it is inevitable that certain phrases will come up. But what do they mean?

- **Location independence:** The ability to access data on multiple processors without knowing where the data is located.
- **Fragmentation independence:** Storing pieces of a single table on multiple processors.
- **Replication independence:** The ability to synchronize copies of tables distributed to multiple processors.
- **Two-phase commit:** When a single transaction updates databases on multiple processors, all databases are updated at once.

With the introduction of Release 6.3, Ingres Corp. is also providing two-phase commit support to ensure the integrity of distributed update transactions.

Users are also becoming interested in what can be considered a subset of distributed database support — client/server architecture. In this architecture, certain processors on the network act as database machines, or "servers." They provide database support to other workstations, which are called "clients."

Cooperative processing is thus made possible. The server runs the DBMS engine, processing work at the same time that the client handles local processing such as screen functions.

At Sybase, Inc., multiple, heterogeneous servers operate in a network environment. Applications access data through SQL statements and remote procedure calls. Business rules are enforced by stored procedures implemented on the server. A form of two-phase commit is provided but currently must be coordinated by the application program. According to Berl Hartman, director of product marketing, future enhancements will include moving two-phase commit coordination to the server. Other client/server vendors include Gupta Technologies, Inc., Oracle and Novell, Inc.

No replacement

The client/server architecture cannot be said to replace distributed functionality. For example, it remains to be seen if it will ever be able to handle heavy production processing needs.

However, for applications that do not have a very large database, do not need much updating across processors and do not require 100% uptime or network reliability, this architecture is a viable solution. Furthermore, because it can be set up with personal computers and networks, it is more readily available than distributed functionality and is relatively inexpensive.

For users intent on true distributed functionality, however, the wait continues. Most will have to be content with what is offered in terms of remote query processing and distributed update processing because even vendors admit it will be some time before true distributed products hit the streets. •

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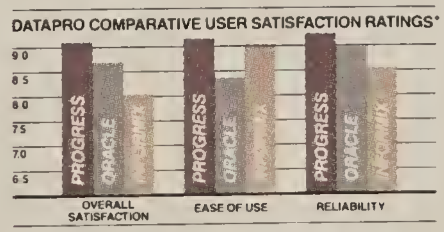

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Advanced Micro Solutions (415) 365-9880	SQL +	HP 9000 Series 300	Single	HP proprietary	1M	ASCII	Embedded	Get, Set	3GL, 4GL, menu and report generators	Basic	Proprietary	HP Shared Resource Management	Rollback	Not planned	No	B tree	$1,295
	DB Magic	HP 9000 Series 300	Single	HP proprietary	2M	ASCII	Interactive	Get, Set	4GL, menu and report generators	Basic	Proprietary	HP Shared Resource Management	Rollback	Not planned	No	B tree	$1,995
Ashton-Tate Corp. (213) 329-8000	Dbase IV, 1.0	IBM PCs and compatibles	Both	DOS 2.1 and higher	640K	ASCII, Dbase II and III, DIF, Framework, Lotus 1-2-3, Rapidfile, SYLK, WKS	Both	Dbase commands, financial functions	4GL, menu and report generators	Proprietary	Proprietary	3Com, Banyan, IBM PC LAN, Netware	Rollback, transaction logging	Not planned	No	Direct index	$795 for standard edition; $1,295 for developer edition
Blyth Software, Inc. (415) 571-0222	Omnis 5 for the Macintosh	Macintosh Plus and higher	Both	Macintosh System 6.0 and higher	1M	ASCII, DBS, DIF, Excel, Lotus 1-2-3, SYLK, WKS	Embedded	None	4GL, menu and report generators	C, assembler, Pascal	Macintosb System 6.0	3Com, Appleshare, Netware, TOPS	None	Currently available	Yes	B tree	$795, additional users $99 each
	Omnis 5 MS-DOS/Windows	IBM PC AT, PS/2 and compatibles	Both	DOS	640K	See above	Embedded	None	See above	C, Assembler, Pascal	MS Windows	3Com, Netware, TOPS Netbios	None	Currently available	Yes	B tree	$795, additional users $99 eacb
Brock Control Systems, Inc. (800) 221-0775	Brock Activity Manager series	AT&T 3B2 and 6386, Compaq 386, DEC, HP 9000, IBM RT	Multiple	AIX, HP-UX, SunOS, TPIX, Ultrix, Unix, Xenix	2M	ASCII	Embedded	None	4GL, menu and report generators	C	None	AT&T Starlan, Ethernet	Disk mirroring, rollback and forward, transaction logging	Not planned	No	B tree	$2,500 per user, 3-user minimum
Computer Associates International, Inc. (516) 227-3300	CA-DB: Generator/ PC	IBM PC AT, PS/2	Single	DOS 3.0 and higher	640K	ASCII, Lotus 1-2-3	Both	None	4GL, menu and report generators	Proprietary	None	None	Journaling, rollback and forward, transaction logging	Currently available	Yes	B tree, direct index, dynamic link	$4,000
	CA-Datacom/PC	IBM PC AT and compatibles	Single	DOS	2M	ASCII and fixed ASCII, DBS, DIF, Lotus 1-2-3, Supercalc 5, SYLK, WKS	Both	Domain constraints, referential integrity	3GL, 4GL, report generator	C, Cobol	None	None	Rollback, transaction logging	Q2 1990	No	Direct index	$1,400
Empress Software, Inc. (301) 220-1919	Empress and Empress 4GL	Mips, Unix-based machines, Decstation	Multiple	DOS, Unix	640K for DOS, 1M for Unix	ASCII	Both	Data types, operators, user-defined functions	3GL, 4GL, menu and report generators	C, Fortran	Apollo, Sunview, X Windows	Apollo Ring, Decnet, Network Research NFS, RFS	2-phase commit, journaling, rollback and forward, transaction logging	Currently available	Yes	B tree	$1,250-$100,000
Gupta Technologies, Inc. (415) 321-9500	SQLBase Server	IBM PCs and compatibles, Sun 3 and 4, Unix-based workstations	Botb	DOS, OS/2, Unix	640K	ASCII, binary, DBS, DIF, Excel, Lotus 1-2-3, WKS	Both	Financial functions precompiled commands, user-defined functions	3GL, 4GL, menu and report generators, windows	C, Cobol	MS Windows Versions 2 and 3	Netbios	Journaling, rollback and forward, transaction logging, unload and load	Currently available	Yes	B tree, hash	$1,995-$2,495
IBM (800) 426-2468	IBM OS/2 Extended Edition Database Manager	IBM PC AT and PS/2	Both	DOS, OS/2	1.6M	ASCII, PC/IXF, WFS	Both	Referential integrity	Menu and report generators	C, Cobol, Fortran, Pascal, proprietary	Presentation Manager	X.25, Ethernet, IBM PC LAN, SDLC, Token-Ring	Rollback, transaction logging	Currently available	Yes	B tree	$830
Information Builders, Inc. (800) 848-8683	PC/FOCUS	IBM AT, XT PS/2 and compatibles	Both	DOS, OS/2	640K	ASCII, Dbase, DIF, Lotus 1-2-3, SYLK, WKS	Both	If-then-else, intersects, unions, outer joins, screen handling	4GL, menu and report generators	C, assembler, Basic, Focus, Fortran, Pascal	Proprietary	3Com, Banyan, IBM, Netware Ungermann-Bass	Rollback and forward, transaction logging	Q1 1990	Yes	B tree, direct index	$1,295
Informix Software, Inc. (415) 926-6300	Informix-Online	Unix-based workstations, including HP 9000, Intergraph, Sun 3 and 4	Multiple	Unix	750K	ASCII	Both	Check table, create database and index, rename table, unload to, update statistics	3GL, 4GL, report generator	C, Cobol, Fortran, Informix 4GL	None	3Com, AT&T Starlan, IBM PC LAN, Novell Netware, TCP/IP	disk mirroring, rollback and forward, transaction logging	Currently available	Yes	B tree	$1,600-$10,000
Ingres Corp. (800) 464-4737	Ingres	AT&T 6386, Macintosh II, Compaq, HP 9000, IBM PC AT, RT and PS/2, Next, Sun	Multiple	A/UX, DOS, HP-UX, Mach, SunOS, Unix, Xenix	640K	ASCII, DBS, DIF, Lotus 1-2-3, Proprietary, SYLK, WKS, Wordstar	Both	Embedded rules, user-defined data types	3GL, 4GL, form, graph, menu and report generators	C, Ada, Basic, Cobol, Fortran, Pascal, PL/1	WindowView	Asynch, Decnet, TCP/IP, LU 6.2	Disk mirroring, journaling, on-line backup, rollback and forward, transaction logging	Currently available	Yes	B tree, direct index, hash, heap	$695
Interbase Software Corp. (617) 275-3222	Interbase	Decstation, HP 9000 Series 300, Sun	Multiple	Domain, HP-UX, SunOS, Ultrix	500K	ASCII, DIF, Rdb, Starbase	Both	Array and blob support, proprietary manipulation language	3GL, 4GL, menu and report generators	C, ADA, Basic, Cobol, Fortran, Pascal	DEC Windows, Motif, News, Sunview, X Windows	Decnet, TCP/IP	Rollback, journaling, disk mirroring, shadowing, instant recovery	Currently available	Yes	Direct index, triggers	$5,000-$100,000
Intersystems Corp. (617) 621-0600	M/SQL	IBM PC, Sun 4 and Sparcstation	Multiple	DOS, SCO Xenix, Ultrix, Unix	4M	ASCII, sequential files	Both	file, inquiry, msg, new, no loop, skip	3GL, 4GL, menu generator, report writer, window manager	MUMPS	Proprietary	Ethernet, terminal lines	Disk mirroring, incremental backup, journaling, rollback and forward	Currently available	Yes	B tree	$1,900-$319,000

All products listed support ANSI SQL, with the following exceptions: IBM, which supports SAA; Sharebase, which supports a version of SQL that is not fully compliant with the ANSI standard; Software Products International, which supports Gupta Technologies' SQL and IBM's DB2; and XDB Systems, which supports IBM's DB2 and SAA.

All products address more than 640K bytes of RAM except Ashton-Tate. The DOS version of Raima's and Microrim's products do not address more than 640K bytes of RAM.

*SQL extensions are commands that let the user take advantage of special features, often user-defined features, that are not included in standard SQL.

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE PLATFORM	SINGLE OR MULTIPLE USER SYSTEM	OPERATING SYSTEMS SUPPORTED	RAM REQUIRED (BYTES)	IMPORT/EXPORT FILE FORMATS SUPPORTED	INTERACTIVE OR EMBEDDED SQL	SQL EXTENSIONS INCLUDED*	APPLICATION DEVELOPMENT TOOLS INCLUDED	PROGRAMMING LANGUAGES SUPPORTED	WINDOWING FACILITIES SUPPORTED	NETWORKS SUPPORTED	RECOVERY CAPABILITIES	WHEN WILL DISTRIBUTED PROCESSING CAPABILITIES BE OFFERED?	CLIENT/SERVER ARCHITECTURE SUPPORTED	ACCESS METHODS	BASE PRICE
MDBS, Inc. **(800) 344-5832**	Knowledgeman/2	IBM PC XT, AT, PS/2 and compatibles	Both	PC- and MS-DOS, OS/2 Standard Edition	512K	ASCII, DBF, DIF, SDF, SYLK, WK1	Interactive	Convert/attach, obtain, pluck, report	4GL, form painter, develops applications, menu and report generators, text processor	C, Knowledgeman 4GL	Presentation Manager	3Com, IBM PC LAN, Netware	None	Not Planned	No	Direct index	$795+
Microrim, Inc. **(206) 885-2000**	R:Base for DOS, 2.11, R:Base for OS/2	IBM PC, XT, AT and compatibles, convertible PS/2	Both	DOS, OS/2	512K	ASCII, DBF, DIF Lotus 1-2-3, PFS, SDF, SYLK	Embedded	Join, intersect, union, tally, project	3.5GL, menu, application and report generators	C, assembler, Fortran, Pascal	None	3Com, IBM PC LAN, Netware	Concurrency control	Fall 1990	No	Btree, direct index, hash	$725
Must Software International, Inc. **(800) 441-6878**	PC Nomad	IBM PC AT, PS/2 and compatibles	Both	DOS, OS/2	640K	Dbase, DIF, Lotus 1-2-3, Nomad, WKS	Embedded	Data integrity and types, outer joins	4GL, menu and report generators	Proprietary	Proprietary	LAN Manager, Netbios	Rollback	Currently available	Yes	B tree	$995
Oracle Corp. **(800) 345-3267**	Oracle Server for OS/2, Oracle RDBMS, Professional Oracle	AT&T, HP 9000, IBM PS/2, Compaq, 386 OS/2-based machines	Both	OS/2, Unix, DOS	10M, 3M	ASCII, Dbase, Lotus 1-2-3, proprietary	Both	Arithmetic and geometric functions, data manipulation capabilities	3GL, 4GL, CASE tools, forms, menu and report generators	C, Cobol, Fortran	DEC windows, Macintosh, Presentation Manager	3Com, Banyan, DEC, IBM, Novell, SNA	Journaling, redo log, rollback and forward, transaction logging	Currently available	Yes	B tree	$1,299 for Professional Oracle; $2,499 for server
Progress Software Corp. **(617) 275-4500**	Progress	Macintosh, Decstation, HP 9000 Series 300, IBM RT and PS/2, MIPS, Olivetti Personal Mainframes, Sun	Both	AIX, CTOS/BTOS, DOS, Ultrix, Unix, Xenix	320K	ASCII, Dbase I-IV, DIF, SYLK	Interactive	Column label, conditional logic constructs, format control, drop index and table	4GL, menu, report and query-by-form generators, screen painter	C, Progress 4GL	Proprietary	Decnet, Openet, Netbios, SPX/IPX, TCP/IP	Rollback and forward	Q2 1990	Yes	B tree	$1,050-$154,000
Raima Corp. **(206) 747-5570**	DB Vista III	Macintosh, Data General AUX 300 and 310, DECstation, HP 9000 Series 300, IBM PS/2 and RT, Sun Sparcstation	Both	Macintosh, DOS, OS/2, QNX, Ultrix, Unix, Xenix	375K	ASCII, Lotus 1-2-3, WKS	Both	Binary code decimal processing, forms, output formatting, sub totals and grand totals	3GL, report generator	C	Macintosh, MS Windows	3Com, Banyan, Netbios, Netware, Univation Lifenet	Rollforward, transaction logging	Currently available on LAN; Q2 1990 for NFS	No	B tree, direct index	$695
Recital Corp. **(508) 750-1066**	Recital	DEC 3100, Sun	Multiple	AIX, Ultrix, Unix	750K	20/20, ASCII, DBF	Both	None	4GL, menu, report and screen generators	C, Cobol, Fortran	None	NFS	Journaling, rollback and forward, transaction logging	Q4 1990	Yes	B tree, direct index	$1,500
Revelation Technologies **(800) 262-4747**	Advanced Revelation	IBM PC and compatibles	Multiple	DOS, OS/2	640K	ASCII, DBS, Lotus 1-2-3, WKS	Both	Currently available	4GL, menu and report generators	C, assembler	Proprietary	3Com, Banyan, IBM, PC LAN, Ungermann-Bass, Netware	Rollback, transaction logging	Currently available	Yes	B tree, direct index, hash	$995
Sharebase Corp. **(408) 378-7000**	Server/300, Server/700 running Sharebase I	Sharebase Server/300, Models 25, 35; Server/700, Models 240, 260	Multiple	DOS, HP-UX, SunOS, Ultrix, Unix	640K	ASCII, DBS, DIF, Excel, Lotus 1-2-3, SYLK, WKS, Wordstar	Both	Audit, create database and index, drop, deny, reconfigure, other user-defined commands	3GL, 4GL, menu and report generators	C, Cobol, Fortran	MS Windows	3Com, Decnet, TCP/IP, Ungermann-Bass, XNS	Disk mirroring, journaling, rollback and forward, transaction logging	Not planned	Yes	B tree	$50,050 - $294,350, includes hardware and software
	Server/8000 running Sharebase II	Sharebase Server/8000, models 250, 350, 450	Multiple	See above	640K	See above	Both	See above	See above	C, Cobol, Fortran	MS Windows	See above	See above	Not planned	Yes	B tree	$165,000 - $570,000, includes hardware and software
Software Products Int'l. **(800) 937-4774**	Access SQL	IBM PC AT, PS/2 and compatibles	Both	DOS, Unix, OS/2	2M	ASCII, DIF, Open Access II and III	Interactive	None	Forms and report generators	None	MS Windows	Netbios	Journaling, rollback and forward, transaction logging	NP	Yes	Hash	$1,595
Sterling Software, Zanthe Systems Division **(613) 727-1397**	Zim/SQLDB	OS/2-based machines	Both	OS/2	640K	ASCII	Interactive	None	4GL, menu and report generators	Proprietary	None	LAN Manager	Rollback and forward, transaction logging	Currently available	Yes	B tree	$1725+
Sybase, Inc. **(800) 879-2273**	Sybase	AT&T, HP, IBM PS/2, Next, Sun	Multiple	OS/2, Unix	4M	ASCII	Both	Control of flow logic and transactions, temporary variables	3GL, 4GL, menu and report generators	C, Ada, Cobol, Fortran, Pascal	DEC Windows, Presentation Manager, Sunview, UIS	Decnet, LAN Manager, TCP/IP	Disk mirroring, journaling, rollback and forward, transaction logging	Currently available	Yes	B tree	$2,495
The Santa Cruz Operation, Inc. **(408) 425-7222**	SCO Intergra	SCO Xenix, Unix-based machines	Multiple	Unix 3.2, Xenix 2.3	2M	ASCII, Lotus 1-2-3, WKS, DBF	NP	None	SCO Accell	C	None	None	Journaling, rollback	Not planned	No	Direct index	$895
Teradata Corp. **(213) 827-8777**	DBC/1012 Database Computer System	Teradata DBC/1012	Multiple	DOS, Macintosh, Unix	200K	ASCII, DIF, Excel	Both	Arithmetic functions, join update, delete, macros, multi-statement request	3GL, 4GL, report generator, interfaces to third-party tools	C, Cobol, PL/I	MS Windows	Ethernet, TCP/IP, XNS	Disk mirroring, journaling, rollback and forward, transaction logging	Currently available	Yes	Direct index, hash	$500,000 - $15 million, includes hardware and software
Unify Corp. **(916) 920-9092**	Unify 2000	Unix-based machines	Multiple	Unix	4M	ASCII, proprietary	Both	Data integrity subsystem	3GL, 4GL, menu and report generators	C, Cobol	Accell, Motif, MS Windows, Open Look	TCP/IP	Disk mirroring, journaling, rollback and forward, transaction logging	Currently available	Yes	B tree, direct index, dynamic link, hash	$2,995
Via Information Systems Corp. **(609) 243-0433**	VIA/DRE	DOS- and OS/2-based machines	Multiple	DOS, OS/2	640K	ASCII, DIF, Excel, Lotus 1-2-3, SYLK	Both	Set-oriented application language	3GL, 4GL, expert system, menu and report generators	C	Presentation Manager, proprietary	3Com, Banyan, Netware	History, journaling, rollback and forward, transaction logging	Currently available	Yes	B tree	$3,500
XDB Systems, Inc. **(301) 779-6030**	XDB-SQL	IBM PC AT, XT, PS/2 and compatibles	Both	DOS, OS/2, Unix, Xenix	640K	ASCII, free and fixed ASCII, Dbase II and III, DIF, EBCDIC, Lotus 1-2-3, SYLK, WKS, Wordstar, Wordperfect	Embedded	Outer join, recursion	4GL, menu and report generators	C, Cobol, proprietary	None	Netbios	Rollback and forward, transaction logging	Q2 1990	Yes	B tree	$595

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Making work groups work

A focus on people, not technology, gets things humming

BY BRUCE D. SANDERS

Many people are getting all tingly these days about "work-group computing." Information systems managers dream of the savings and higher productivity that "downsized" groups and systems will bring. Users imagine on-line "meetings" that are suddenly energized by an excitement previously reserved only for the best video games. Vendors thrill at the promise of big profits from sales of application software, network cards and other connectivity "solutions." The release of new work-group products, such as Lotus Development Corp.'s Notes, sets many pulses racing even faster.

But hold on a minute. There is a hefty gap between these romanticized visions of work-group computing and the hard realities of everyday organizational life. Making work groups really work is more than a matter of getting the product out of the box and setting it up correctly. Certainly, proper use of technology is important.

However, the success of work-group computing also hinges on understanding a basic but vitally important fact: Work groups consist of people.

Thus, knowing a few basic realities about individual and group motivation can help IS managers make existing work groups even more effective while helping new ones get off on the right foot.

The most important thing to remember about work groups is that they want to be *productive.* That's right. Despite age-old stereotypes, decades of research in organizational psychology have shown that truly lazy employees are rare. Given the right work circumstances, many workers actively seek out opportunities to excel.

Most people enjoy being on teams. That's because teams are places where members can build their knowledge and exchange skills. Teams let people celebrate big victories, such as finishing a major project, and such smaller victories as making it through another week on the job. Even when things aren't going as well as everyone would like, team members need opportunities to commiserate together and dilute the blame.

Paul Schulenburg

People who choose to work on teams almost always join them with the hope of achieving more than they would as individuals. On the other hand, workers grouped against their will are more likely to feel demoralized.

Even so, many employees still expect teamwork to improve their productivity. Moreover, although a lot of people complain about long, boring and inefficient meetings, deep down they yearn for the companionship that those meetings provide.

Even if people didn't like teams, work groups would still be necessary: Only the most trivial of tasks can be done entirely by one lone ranger.

Can't have it all

None of this, however, guarantees that people will *always* accomplish more when working on teams. A set of studies considered classic by organizational psychologists illustrates that people on teams unconsciously exert *less* effort than they would have as individuals (see story page 89).

Two other factors are vital to work-group productivity: good coordination and a sense of individual recognition. Unfortunately, these two factors are also

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Sanders is a consultant and an organizational psychologist based in Vacaville, Calif. He is author of *Computer Confidence: A Human Approach to Computers.*

……

- **Small teams have fewer conflicts**
- **Coordination helps keep people connected**
- **Team members want to be productive**

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It seems paradoxical, but good coordination often means giving people *less* information instead of more. Telling every team member all they might possibly want to know can actually disrupt teamwork rather than enhance it. Instead, good coordination involves filtering information.

As far as recognition goes, the underlying need is not so much for glory or praise but for *control.* Workers like to feel in control of their surroundings.

Building blocks

The following are some tips on how to build an effective work group:

- Focus on people, not technology.
- Recognize a worker's need to be productive.
- Emphasize and practice good team coordination.
- Keep teams small.
- Balance information sharing and privacy.
- Recognize both team members and leaders.
- Keep on-line presentations short and graphic.
- Make good use of project management tools.
- Maintain an on-line skills inventory of group members.
- Keep equipment trouble-free.

Feedback about work is crucial for a feeling of control, and recognition is a powerful form of feedback. As team members strive to become more productive, they all want to know how to improve their work efforts. For example, team members may enjoy hearing about how the team is doing as a whole. They also will want to know how they are performing on and individual basis.

Once they know that work-group members need coordination, recognition and a sense of being productive, savvy IS managers will look to the basic tasks of work-group computing for ways to fulfill these needs.

Info-sharing key

When team members know the details of what others are doing, coordination comes naturally. Furthermore, news of individual contributions can be spread quickly, giving the contributor immediate and valuable recognition of their influence. Work-group systems give management yet another forum for providing all-important feedback to employees.

For example, imagine that a programming group finished a six-month conversion project seven weeks ahead of schedule and considerably under budget. Team leader and members alike undoubtedly would appreciate official, on-line recognition.

One effective way to foster coordination among work-group members is to constantly emphasize the value of sharing information. IS managers can talk about the value of exchanging information with or without computers. Showing recent examples of how freely sharing information helped the group achieve its project objectives is one way to accomplish this goal.

Such discussions create an atmosphere that encourages group members to make conscious efforts to keep their colleagues current.

Another approach to fostering coordination is to champion the purchase of networked versions of personal computer software instead of single-user packages whenever feasible. Make sure that users are properly trained so that they can take advantage of all the network's features.

A final, but important, way to ensure coordination is to make sure that the computer system on which the group depends works well. Frequent breakdowns will frustrate users, who will soon stop trying to get in touch with each other. Elementary, but crucial.

With the popularity of voice-mail systems and electronic mailboxes, many users today are accustomed to leaving and retrieving messages or "meeting" in many different mediums. However, when it comes to coordination, there's no genuine substitute for real people regularly gathering. The immediate interchange of ideas that occurs in a meeting can stimulate creativity or focus action. When handled well, in-person interchanges present good opportunity for individual recognition.

Getting busy teammates to sit down at the same time in the same place is a tough job, however. One alternative is to take advantage of the scheduling and meeting modules that now come with many E-mail packages.

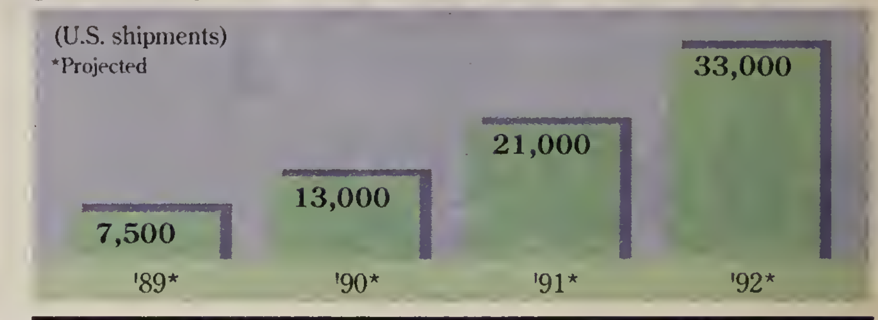
Products such as Right Hand Man from Futuresoft, Inc. in Metairie, La., also let teammates conduct an actual on-line meeting over the computer network. Each participant uses an assigned window to enter comments, which then appear on all of the screens of the team's computer network.

Show and tell

At some point, though, work-group managers will need to impart detailed or complicated information to the whole work group. The guidelines that produce effective in-person presentations also apply here. In fact, because "listeners" lose important visual clues from you, these principles are doubly important.

Gangway for groupware growth

U.S. shipments of LAN-based integrated office systems are predicted to grow at a compound annual rate of 78%



Source: International Data Corp.

CW Chart: Doreen Dahle

To get an idea of effective tactics, listen to an imaginary, ideal worker telling his IS manager the best ways to communicate on-line with team members:

"So you say you want to inform me and the others on our team? Fine. We'll give you a few minutes of our attention. No more.

Want to persuade us? Better take less than a few minutes. Remember to show some slides with colorful text and graphics. You should also give us copies of the slide information, so that we can take notes. You don't need a fancy studio production, but your presentation shouldn't look like some avant-garde ransom note either. You know how the people on our team always travel, so think about packaging your presentation so that we can play it on our laptops.

"While you're at it, you might as well let us record our responses to your presentation via computer and get them back to you. And, hey, you know how we like recognition. Maybe find some way that everybody can mark their suggestions with their initials. That's about it."

Of course, few real users are this vocal (and clear) about their needs. Nevertheless, keeping in mind these imaginary ideals will help IS managers make the most of their formal, on-line presentations.

These rules work both ways, by the way; the same principles that will make your presentations successfull also can be effectively used by team members themselves.

Small is beautiful

It's unfortunate, but the larger the project, the harder it becomes to coordinate tasks and recognize individual contributions. Project management software can help this situation.

Unfortunately, while the majority of work-group computing is PC-based, the most sophisticated project management systems run on larger mini- or mainframe-based systems.

Nevertheless, there is still hope. For small teams working on short-term jobs, traditional project management software may be too large and complex. Personal information managers, such as Chronos Software's Who-What-When Enterprise and Information Research's Syzygy/Network, are generally less complicated and more flexible than mini- or mainframe-based systems. The best of this software permits mutual export between project management programs and group members' personal information managers — another bonus.

Work-group data basics

As noted earlier, good work-group coordination depends a great deal on information sharing. Effective database management tools make it easier for one team member to retrieve relevant information entered by other team members.

The biggest challenge in effectively developing and using such tools in a work group is that one team member often does not know what kinds of information others have entered.

One solution is to use a

Viva la difference in international work groups

Japanese fare best in computerized work groups, Europeans worst and Americans somewhere in between, says an international organizational development consultant.

Cultural differences greatly influence how well and comfortably different nationalities work in small groups using networked personal computers, says Tony Adams, a Geneva-based consultant specializing in helping European firms build work groups.

For the Japanese, working in small groups "is almost not an issue," Adams says. "It's part of their culture and nature." Their willingness to discuss details of work translates well into computerized teams, he says.

On the other hand, Adams says many Europeans are more formal and private in their business dealings. "People are very structured; the jobs are very defined. In Switzerland, for example, people may work with each other all day and never call each other by their first names."

The result is that while many European organizations are keen on team-building and work-group computing, progress has been slow, he says. Adams adds that a wide diversity of languages and cultures presents another obstacle.

Americans fall somewhere in the middle, according to Adams; they are technologically astute but tend to be more individualistic by nature than Europeans or Japanese.

While growing global awareness and the rapid spread of PCs, local-area networks and work-group applications software have already started to change some of these generalities, dramatic advances will take time, Adams says.

To help break down work-group barriers, Adams has developed an $895 PC-based software product that helps evaluate, analyze and diagnose teams. The product, called Supersync, can be used to examine team attitudes, compatibility and work-group performance and can help spot possible interpersonal conflicts, according to Adams. It is produced by Swix Tech U.S.A. in Irvine, Calif. Up to 45 existing or prospective work-group members answer 10 question sets about team communication, information sources, management and other areas. Responses are then recorded on a PC, scored and analyzed using another Supersync module.

Bill Wiedman, a principal at Synergy, a Tulsa, Okla.-based organizational consultancy, says he has used Supersync on three occasions and finds it "extraordinary." "In one case, the tool identified a woman in a key administrative position who had a borderline psychosis. Everyone found her to be the whole problem," he said.

Stein Roaldstet, president of Scandinavian Management Development Corp. in Madison, Conn., said the package can help managers make better decisions because it gives them real data instead of limiting them to their own perceptions.

JOSEPH MAGLITTA

good user interface that lets team members do a "fuzzy search." With this method, work-group members do not need to query precisely the right words to locate entries made by other team members. Programs such as Lotus Development Corp.'s Magellan can help group members locate approximate matches as well as exact ones.

Of course, it's possible to have too much of a good thing. Work-group members can actually have access to too much information. Proper fragmentation, replication and allocation with a distributed database management system go a long way toward avoiding information overload.

It's also possible to have too much openness in a work group. Although good employees prefer accountability to anonymity, there is a time for work-group privacy. IS management can take steps to ensure that work groups are effective *and* respectful of privacy and security.

For example, work-group scheduling software should not require users to make their complete calendars available for scrutiny by other team members. All employees need unscheduled time to digest information, handle the unexpected, do strategic planning and perform many other tasks. As a result, they do not want to reveal their entire schedules, especially if others can chomp off blocks of their valued time for meetings.

Let's assume that all the right tools are in place for information exchange: scheduling of meetings, preparation of team presentations, project management and database management. Hopefully, that will give you a decent idea of the needs of work-group members.

Falling apart at the teams

If team members are in conflict, however, it's a good bet that coordination, recognition and productivity will suffer.

One novel approach is letting PC software analyze possible team members and then suggest a good blend (see story page 88).

A less exotic approach is to maintain a catalog of work-group skills on your DBMS. Without this kind of catalog, an organization may be unaware of the many talents and interests available for team service; there is simply too much to discover and remember.

A third approach to maintaining team harmony recognizes that fewer people on the team will produce fewer arguments. A simple principle: Keep teams as small as possible.

Effective work-group computing recognizes and fosters interaction, coordination and recognition. Information systems managers can help ensure the success of work groups in their domain by focusing on users' needs and desires rather than on technologies, and on teams rather than individuals. •

Learning the ropes

In the early 1900s, a German researcher named Ringelmann conducted a now-classic study that can give today's information systems managers valuable insight into work-group performance.

Ringelmann's study focused on how much strength people exerted to pull on a rope, as one might do in a tug-of-war. Here's roughly how the experiment worked:

One person pulls on a rope. The amount of effort exerted by this pull equals, say, 10 units. Seven more people are recruited, each of whom also pulls exactly 10 units. All eight are put together and asked to tug as a team. From multiplication alone, you'd expect a total pull of 80 units. Factor in the *esprit de corps* stemming from team cheers, and you'd hope for at least 100 units. Right?

Very wrong. Performance actually gets *worse* as more pullers are added. Ringelmann found that groups of two pull at only about 90% of their total individual scores and that groups of three at only about 85%. Groups of eight pull at a pitiful sub-50% level.

Two other findings make these results even more fascinating. First, performance is largely unconscious. Team members actually expect their total tug to exceed the sum of the individual outputs. So they anticipate more pull back on the rope, not a reduction in their efforts. Second, in such studies, the output of individual team members increases markedly when pullers are convinced that their individual contributions are being measured.

While working in a modern organization isn't exactly the same as tugging on a rope, there are some very valuable parallels and lessons to be learned here.

People toiling at both kinds of tasks often get in each other's way, don't communicate their plans clearly and fail to give it their best because they feel their individual contributions count for less.

There are no easy solutions. However, telling individuals that their efforts are recognized (and measured), fostering good communication and simply being aware of this phenomenon can go a long way towards offsetting it.

BRUCE D. SANDERS

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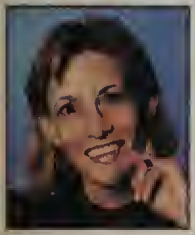

Catching up on some reading last week, I picked up a magazine and saw that Hewlett-Packard, hurting from slow returns in its high-end lines, is reorganizing and "excessing" as many as 1,700 people.

Whew . . . *Excessing.* What a relief. For a minute there, I thought that somebody — maybe 1,700 somebodies, actually — might get laid off out of all this. Fired, even. Wrong. No layoffs here, folks — just a whole lot of excessing going on.

Nothing we can't handle, right? If we can take in Batman the Movie and Quayle the Vice-President, I guess we can deal with Excess the Verb.

Of course, some curmudgeonly folks will probably protest that this is a step too far — that in a period of hard times in the computer industry that has already caused work force reductions, downsizing, reorganizations, reconfigurations, attrition, planned attrition, selective attrition, targeted attrition and voluntary early retirement, one more creative euphemism amounts to wretched layoff — uh, firing — uh, *excess.*

Continued on page 96

Airis of confidence

Chicago start-up takes aim at 'notebook' market

David Joel

Airis' *Valentor, Jeff Maziarek and brother Michael, left to right*

BY ELLIS BOOKER
CW STAFF

CHICAGO — Can a couple of terrific guys make it in the high-stakes game of "notebook" computers — in the very shadow of their former employer, the industry leader?

Steve Valentor and Jeff Maziarek think so. Three days after leaving Zenith Data Systems in Glenview, Ill., the two founded Airis Computer Corp. on July 24, 1989. Actually, they founded Pair Computer Corp., but after a trademark search, they switched the name to Airis.

The original name was an inside joke, one that clearly illustrates the ambitions and images of the founders.

"We wouldn't be Apple [Computer, Inc.] . . . we'd be Pair," said Valentor, Airis' executive vice-president of engineering.

Valentor, 31, was formerly a product development manager responsible for desktop computers at Zenith; Maziarek, 33, executive vice-president of marketing, was Zenith's marketing manager for video products and launched its Flat Technology Monitor product. Jeff's brother Michael Maziarek, 40, a marketing and management veteran with no computer-company background, is the third cofounder.

The three promise to bring Airis' first product — an Intel Corp. 80286-class, six-pound "notebook" computer priced under $2,000 — to market in May. While hesitant to divulge too much too soon, they confirmed that the computer will be based on the Intel Corp. 80286 chip and that it will weigh roughly six pounds. Chicago area speculation is high that the machine will also contain a 20M-byte hard disk and have a backlit Enhanced Graphics Adapter LCD screen.

Airis officials will also go on the record that their entry will cost under $2,000. This could give the start-up a wedge against established competitors such as the Computer Systems Division of Toshiba America Information Systems, Inc., which recently introduced a 6.2-pound 286-based notebook computer. The new firm will also have to go up against Compaq Computer Corp., with its Compaq LTE/286, and NEC Technologies, Inc., which in 1988 introduced the Ultralite — the computer that single-handedly created the notebook category — and is rumored to have a more powerful machine due out soon.

Today, components for its maiden product sit on tables around Airis' eight-room office, which doubles as a component-

Continued on page 97

Wang slashes debt, sells lease finance outfit to GE

BY NELL MARGOLIS
CW STAFF

LOWELL, Mass. — Company President Richard Miller last week drove Wang Laboratories, Inc. $250 million further out of debt with the sale of its international lease financing operation to leasing giant GE Capital Corp. (GECC). According to Wang, some $215 million worth of the purchase price will be offset against bank debt, reducing the computer maker's marker to approximately $93 million — roughly 17% of the $575 million Wang owed its lenders last August when Miller took the helm of the foundering company.

The GECC deal marked the largest yet in a series of asset sales aimed at returning Wang to long-elusive profitability while refocusing its sales efforts on core markets. For Miller, it was also a buy with a little help from his friends: GECC is a unit of his former home base, General Electric Co.

"It sounds to me like Miller did a great job at GE; $250 million is some vote of confidence," said Chris Christiansen, an analyst at Meta Group, Inc., in Westport, Conn.

Miller's fiscal reconstitution campaign — which, Miller said last week, is expected to free Wang of all bank debt within the next several months — is earning high marks in the investment community, Christiansen noted.

Nevertheless, he said, the jury is still out on the Wang turnaround effort and its leader. "What everybody still wants to know is, when will we see profits?" Christiansen said. "And will he be able to attract new customers?"

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Margolis

CONTINUED FROM PAGE 93

One such curmudgeon, in fact, had already had a go at the magazine I was reading; the word "excessing" was circled, and "arghhh!" penned in. Pretty boorish, huh? People should know better than to excess off the first thoughts that come into their minds. Of course, maybe he was simply fighting excess with excess.

On the other hand, maybe it doesn't take Henry Higgins to raise an eyebrow — because maybe more than the English language is being done in here. Clearly the person who signed in on the margin right below the curmudgeon thought so. "This is what happens," the second commentary read, "when people become 'human capital' and businesspeople are allowed anywhere near words."

Or maybe it's what happens when facing squarely up to sticky situations has gone so far out of style that it never even occurs to a company to try it. What, us fire? Perish the thought; we're a *people-oriented* company. *Layoffs?* Not here.

In technology, I suspect, the whammy is double: Not only are firms laboring under a staggering weight of post-modern corporate jargon, but they also exist in an atmosphere in which the thick fog of techno-babble rarely lifts. That you'll probably hear Fred Savage say the F-word before you'll hear a computer company voice an unvarnished, unpopular truth (e.g., *the product is late*, or *we can't do that yet and might not ever be able to*, or *unfortunately, we have to lay off 25% of our work force*) is pretty understandable.

This could go a long way toward explaining how an abomination like "excessing" of employees could come from HP, a company that prides itself on being — and being recognized as — a firm with integrity and a great place to work.

The trouble is, not all euphemisms are silly and harmless. Last year's hands-down computer industry winner — "solution" — is the benign type. Nobody knows what it means, of course; in the long run, a word that means anything to everyone means nothing to anyone. Use it, however, and the most you risk is a skeptical reaction from a user who continues to suspect that, yeah, you *are* selling "products." The user might feel slimed, but devalued? Unlikely.

"Excessing" is considerably more insidious. Doubt it? Try calling someone whose respect you value and telling them you've been excessed. Try saying it to yourself in the mirror (preferably where you can't be overheard or seen.) Fired and laid off are what good people can get under bad circumstances. "Excessed" shouldn't happen to humans under any circumstances. Arguably, it shouldn't even happen to inventory. Decidedly, it shouldn't happen at HP.

Margolis is *Computerworld's* senior editor, industry.

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IN BRIEF

Eyes on the prize, but hands off

The National Academy of Engineering's first international Charles Stark Draper Prize was awarded late last month to the industry pioneers credited with inventing the semiconductor microchip, **Robert Noyce** and **Jack Kilby.** Noyce accepted the honor but not the money: His $175,000 share of the prize goes, at his direction, to **The SRC Competitiveness Foundation,** which was recently established by The Semiconductor Research Corp. to expand and enhance science and math education all along the educational spectrum.

. . . .

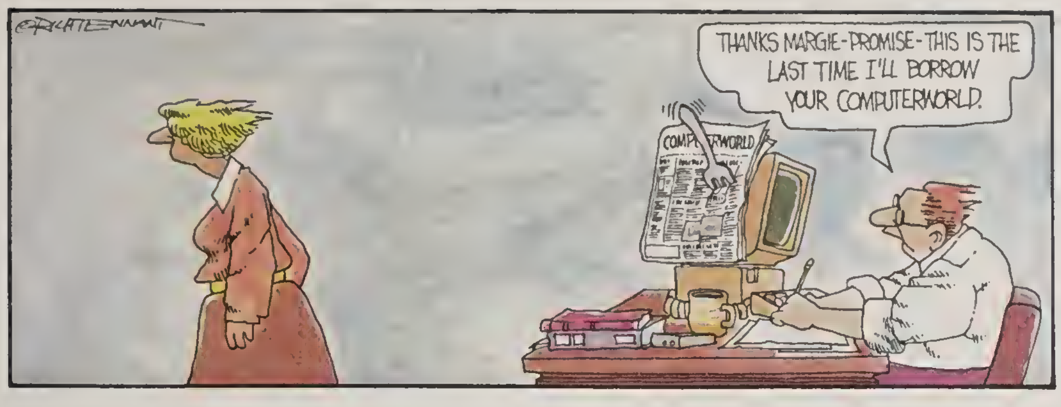
Court report: No laffing matter

Steven Laff, founder and president of Los Angeles-area computer dealer **Friendly Computers,** described himself to the press as "outraged" as he fired off a class action lawsuit against **Hyundai Computer Corp.** last week. According to Laff's allegations, the Korean computer giant is reneging on its promise to replace a brace of misbehaving computers used by a Paulist priest in his efforts to serve the University of California at Los Angeles community.

. . . .

Court report: New staffing matter

Independent Election Corp. of America (IECA), a small, Lake Success, N.Y.-based firm that distributes proxy materials and tabulates shareholder votes, hit its longtime IS supplier **Automatic Data Processing, Inc.** with a $100 million-plus trade secret suit last week. Giant ADP, IECA said, is basing its entry into the shareholder communications niche in large part on information and services wrongly delivered by two former IECA executives — both named as co-defendants — who now work for ADP.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Hill A&E a box office success

Renamed arts management specialist bridges high tech, show business

BY ELISABETH HORWITT
CW STAFF

GUILFORD, Conn. — To hear Hill Arts & Entertainment Systems, Inc. founder Laurence Schwartz tell it, there is no business like show business — fortunately — when it comes to selling software and systems integration.

"The arts [world] lags about 10 years behind the business world, just in terms of getting computers," Schwartz says. Symphonies and theaters tend to be "$3 million to $4 million companies with $100,000 deficits," run by a loose consortium of board members and volunteers who must approve all computer purchases, he adds.

Small wonder it typically takes Hill A&E 18 months to close a deal on its turnkey business management system for entertainment companies. The system, which runs on Novell, Inc. Netware servers and more recently on SQL-based servers, consists of a broad range of applications, including box office management, ticketing, fund-raising and accounts payable and receivable [CW, Feb. 19].

Star-studded

Nevertheless, Hill A&E has managed to thrive in its rocky niche. Called Artsoft, Inc. until this month, the small firm serves the needs of such arts world luminaries as the Boston Ballet Co., New York City Center and the Seattle Symphony. The company did $7 million to $8 million in sales last year and plans to be a $100 million operation by the end of the decade, according to Schwartz.

The secret of Hill A&E's success seems to be its people, most of whom have both arts and computers in their blood. "I call us a retirement home for arts people," Schwartz says. With the recent introduction of a sports version of the firm's product, "It's starting to be for sports as well."

Schwartz himself is the prototypical Hill A&E employee. "I did theater all my life," he says. His career includes "working with a bunch of theaters, working in rock 'n' roll," then attending Yale Drama School and studying Technical Theater in 1983. However, during his last year at the school, Schwartz "bought a PC and got hooked on computers."

So instead of graduating, Schwartz hired his former Yale Drama School professor, Robert McClintock, and founded Artsoft, Inc., which, once it got off the ground, sold turnkey business management systems to theaters and symphonies.

Rich Frishman

Seattle Symphony's Braun *appreciated Hill A&E's background in the arts*

Hiring from the niche that it serves has apparently given Hill A&E several competitive advantages. First of all, employees have tended to stick around: The company has grown from 17 to 50-plus employees in the past two years and has lost only three or four people during its existence, Schwartz claims.

"We do it for passion," Schwartz says. "If we were looking for quick bucks, we wouldn't be in a not-for-profit niche," he adds. "People here could make four times the money elsewhere."

Second, Hill A&E can speak its customers' language, establishing a rapport that can provide a crucial edge in competitive bids. The firm "seemed like the kind of people we could deal with, partly due to their arts background, partly a sense of commitment," says Seattle Symphony systems director Deborah Braun.

Even more important to Braun, she says, was her perception that the company's artsy side was tempered with solid documentation and support, which can be hard to find in such a small market niche. "I felt they were more structured and had an existing support department, as well as documentation on their system; they seemed stable." Braun's previous vendor had introduced a new version of its product and left the symphony stranded without support, she says.

Inherent understanding of its customers' needs also shows up on Hill A&E's service side. The firm's support department stays open — or is at least available by beeper — from 8 a.m. to 9 p.m., local time, so that it can be there for customers during those crises that can occur right up until curtain time.

"They're very in tune with the kind of time frame I'm working on," says Leon Scioscia, general manager for Herberger Theater. "If someone doesn't have the answer [to one of my questions right away]," he adds, "they try to get me someone who does."

For example, a theater may need to generate 50 million mailing labels in a single night, or print up thousands of additional tickets just before a performance. In addition, users can need a lot of hand-holding because turnover among key operators is often extremely high. One theater went through 10 box office managers in a single month, Schwartz recalls.

Finally, Hill A&E's theater background has enabled it to avoid the technology-for-its-own-sake trap and focus on just those areas of innovation that address its clients' priorities. For example, software developers put a lot of effort into making a Microsoft Corp. MS-DOS-based Novell Netware system support something close to real-time database updates, so that multiple box office operators do not simultaneously assign the same seats to different people.

Similarly, the move to SQL — which cost a megabuck or two — provided users with crucial querying flexibility. Fundraisers and marketers can now target "blue-eyed, left-handed subscribers who missed one show last year," McClintock says.

Know your lines

The former Artsoft, Inc.'s path has not always been smooth, admit co-founders Laurence Schwartz and Robert McClintock. Its first false step was the pair's first product, software that automated lighting designers' paperwork.

"No one wanted it: We forgot that lighting designers have no money or computers," Schwartz says. The next mistake was a foray into video vending machines, as a joint venture with a UK-based company. "We nearly went under," Schwartz adds.

Artsoft has since learned not to stray too far afield from its area of expertise and success — but it has not been easy. "[When] people say, 'You've got a great fund-raising package — why not sell to Red Cross?' it's hard to say no," Schwartz explains.

Major growing pains occurred in the summer of 1987, when Artsoft migrated from its Wang 2200 systems to Novell, Inc. local-area networks. The transition bordered on disaster as Artsoft struggled to learn how to do its own installation, training and full support of hardware, software and networks for the first time. "We were exhausted," Schwartz says.

In the last two years, following the friendly acquisition by risk management consultancy Hill Group that transformed Artsoft into Hill Arts & Entertainment Systems, Inc., the firm has grown from 17 to 50 members. Its success has landed it at a critical decision point, Schwartz says. "We are trying to handle our growth, now that we are no longer entrepreneurs."

ELISABETH HORWITT

Airis

FROM PAGE 93

assembly site for the dozen or so software and hardware designers that Airis has hired as contract labor.

The offices themselves, carved out of a former Beatrice/Hunt-Wesson Foods processing plant located in a blind alley beside a vacant lot on Chicago's northwest side, belong to realtor John Marks, who provided the company's seed money and remains Airis' sole backer to date.

The trio talk about their new products, the computer business and each other with delightful enthusiasm and an infectious *esprit de corps.*

Nobody said it was easy

"It's always politics," Valentor said about his last job and about working for big companies in general. "You find you try to achieve the boss's objective rather than what you think is important."

"If we're going to do something, we want to be a leader," Jeff Maziarek added. About the odds on competing against the likes of Zenith, which analysts believe holds about 29% of the laptop computer market, he replied, "If it was easy, everyone would be doing it."

Airis' edge, they said, will be price and an appreciation for customer needs, such as the requirement for a much better battery life than current laptop or notebook computers provide. "Users want to have more than six hours," said Valentor, who declined to say how much battery life the Airis computer will offer.

Laptop computer design, he continued, is simple: "It's called 'trade-off' management." There are no hard rules on how a vendor should juggle qualities such as speed, weight, screen quality, battery life and size, he said.

According to the business plan, Airis will be a $50 million to $60 million company by the end of its second year. The founders believe they can reach this mark without relying on large government contracts.

"Our business plan works without them, and while they would be nice . . . those contracts don't last forever," Michael Maziarek noted.

David Joel

Airis' Valentor: *Users want better battery life*

The Airis computer has been designed to be "snapped together," a feature Valentor and Jeff Maziarek said can be handled locally much more inexpensively than by using overseas assembly. However, the two have traveled to the Pacific Rim to find several of their component suppliers.

Can they make it?

At some point companies begin to see their products as commodities and lose the image of themselves and, therefore, the quality of their people and products, Michael Maziarek said.

"The only reason a company loses that idea," he added, "is because somewhere along the line it made a conscious decision to lose it."

Finance 101 for the IS pro

Real-time cost accounting poses a definite challenge for systems people

BY WALTER J. POPPER
SPECIAL TO CW

This column is the third and last in a series that describes major business functions and how they affect information systems professionals.

Financial managers have an entirely different perspective on the business from their counterparts in other functions. Nevertheless, it is an essential perspective and arguably the most legitimate one — that of the shareholder who owns the business. After all, what is a business if not a money machine, an organization operated to provide equity holders the greatest possible return on their investment?

Along with operations and marketing, finance is one of three major aspects of business that every systems professional should understand. Each contributes in a unique way to the business enterprise; each, in turn, presents special opportunities for the use of information and information technology.

Investors and their agents on Wall Street would argue that return on equity is the single best way to measure a firm's financial health. Which companies are on top on the basis of this criterion? The ones that average 20% or more return on equity, year after year. They are excellent at devising strategy, marketing products and managing operations, and they also pay attention to the financial implications of all aspects of the business.

From this perspective, the single overarching goal of all managers, as well as other employees, is to operate the business in the best interests of the owners. The finance function is charged with keeping the business healthy — cash flow strong, accounts receivable under control, accounts payable on favorable terms, debt in balance with equity and so forth. Finance executives set policy, obtain funds in the capital markets, arrange for currency swaps, hedge on interest rates or the cost of raw materials, arrange borrowing and deal with investment bankers on mergers, acquisitions and divestitures.

Who's winning?

But the most difficult role of the financial manager, and one of the most important ones, is keeping score — tracking past activities and planning for the impact of current decisions.

It is in this regard that the financial perspective is of critical importance to the information systems professional.

Scorekeeping is no easy matter, even with the endless data stream generated for the financial types by all the information systems they have commissioned over the years. Yet it is essential to keeping the business on target. Until management understands the cost structure of the business, decisions will be educated guesses at best.

Accounting applications are the essential scorekeeping tools of the finance manager, as of the business executive who uses financial information. The best financial managers can't guide the firm to success unless these tools are well-designed, easy to use, powerful in their ability to access and analyze data and targeted to track the few critical variables in the business.

Crossing boundaries

In most large firms, data and applications should be easily accessible across the boundaries of functions, geographic regions and business units. Consolidation of data by product, region, sales office or business should be a simple matter. And with modern information technology, it should be possible to produce accounting data on-line at the end of the period, rather than on reams of paper six weeks later.

But it is not enough to automate existing accounting procedures. Even more important is the effort now under way in many firms to revise accounting, moving away from an elaborate system of allocated costs and overhead to an approach in which direct costs are accounted for where they are incurred.

This trend will affect operating managers and other executives by eventually providing an accurate picture, down to a minute level of detail, of the contribution to profits from every part of the operation — every machine on the line, every well in the oil field, every aisle in the supermarket.

> TO AN EVEN GREATER degree than today, IS professionals will be held accountable for the costs of projects and services as well as for the measurable benefits that they produce.

This trend to more accurate direct cost analysis will also have an impact on the IS area. To an even greater degree than today, IS professionals will be held accountable for the costs of projects and services as well as for the measurable benefits that they produce.

Information technology investments, reviewed in the capital budgeting process, will likely face ever-increasing scrutiny with improvement of the state of the art in measuring costs.

Finance, along with marketing and operations, are areas to which few IS professionals gave serious thought in the past. That situation has been possible for a number of reasons.

First, information technologies were changing so rapidly that it was all a person could do to keep up in one or two technical specialties.

Second, business knowledge was not considered critical to success in systems. Even in recent years, when the role of IS has been one of service to the user, IS professionals needed only minimal business knowledge to turn user requirements into program modules.

Finally, many aspects of business were considered too "soft" and illogical to warrant serious attention from IS professionals. Today, however, the IS professional whose skills are limited to technical areas is at risk of becoming obsolete.

Popper is a vice-president at Index Group, Inc., a Cambridge, Mass. management consulting firm specializing in information technology.

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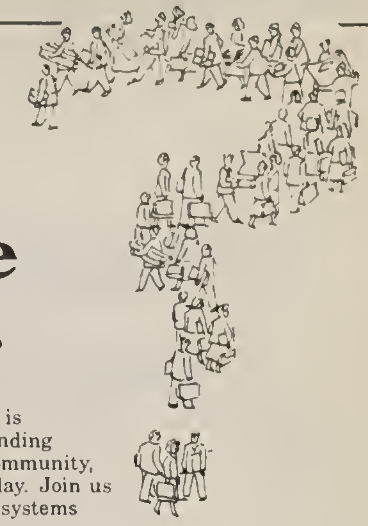

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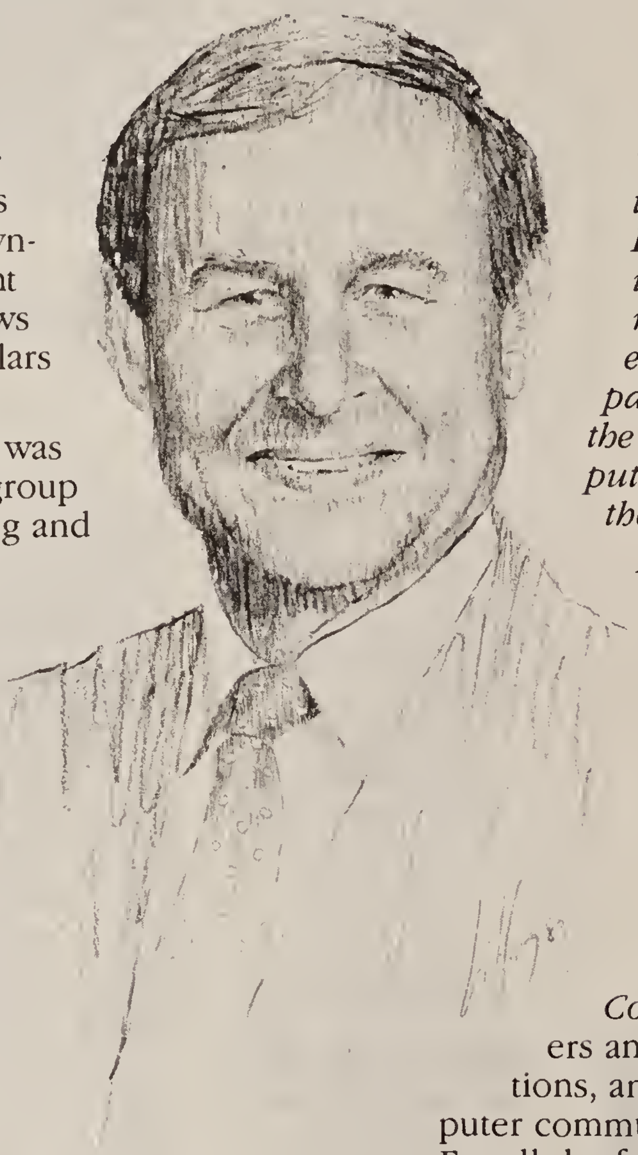

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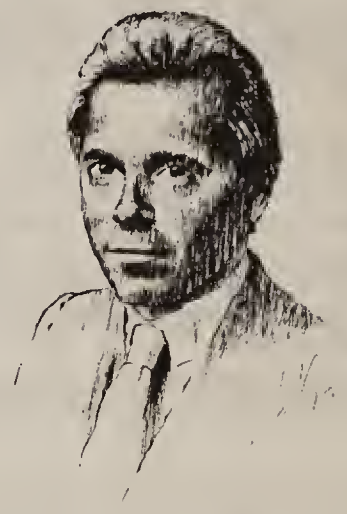

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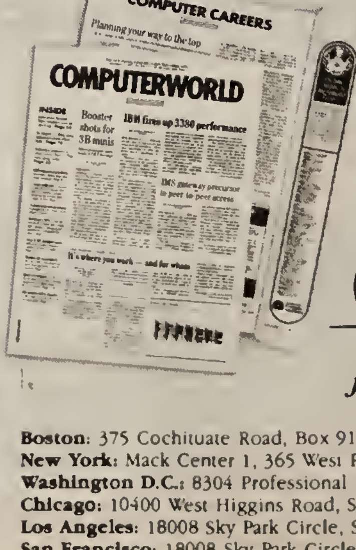

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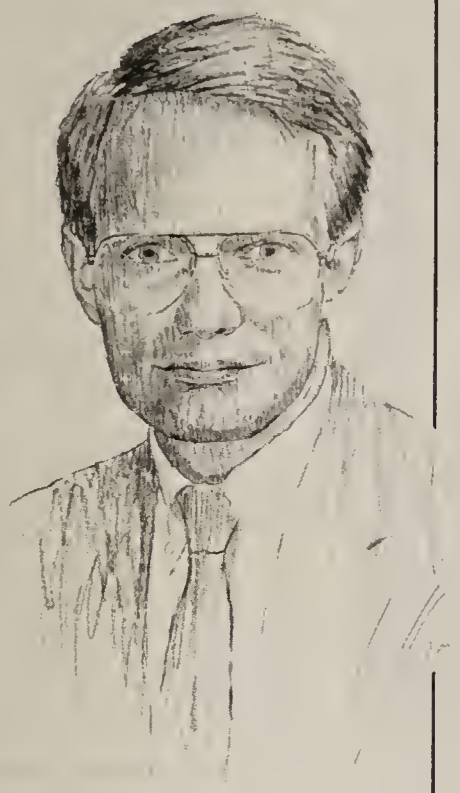

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Teubner & Associates, Inc., a developer of communications software based in Stillwater, Oklahoma, has just introduced FaxGate into the IBM arena. FaxGate, the facsimile gateway for IBM mainframes, allows direct printing of high-quality output on virtually every fax machine worldwide. Now it's up to President Russ Teubner to utilize the most cost-efficient means for telling IBM mainframe users about this one-of-a-kind communications product.

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Courts are struggling to shape fraud law to the complexities of computers

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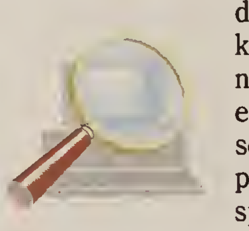
"This little baby runs at 64 MHz with zero-wait state on a 486Z. It will do everything you want to do in your business. It's new and on sale today, but it will be the technology we use for 20 years."

Buyers of computer hardware and software often rely on their seller for information. Whether they get good information or not depends on whether they are dealing with an honest, careful vendor or a high-pressure salesman. Whether they have a legal right to receive good information depends in part on the law of fraud.

In the U.S., we have a common law tradition of "buyer beware." This principle has meant that a seller is prevented only from telling blatant lies about obviously important aspects of his wares. Beyond that caveat, the seller only needs to live up to the literal terms of a written contract. He can hype, embroider, conceal important facts and make grand predictions.

Many courts and juries still follow the maxim of buyer beware. Their approach assumes that every buyer must mistrust his seller and verify every fact that is not part of a written contract.

This traditional attitude toward the marketplace works for simple purchases but, in my opinion and the opinion of a number of courts, is inappropriate for many technology contracts. In buying technology, accurate information is often crucial, but it is often difficult to obtain. Many buyers ask for and receive information from their seller on which they *must* rely.



According to common law tradition, fraud occurs if the seller intentionally misrepresents an important fact or fails to disclose important information that it should disclose, and the buyer is consequently harmed by relying on that misinformation.

Honesty is the best policy

The key issues for courts and juries to resolve are what information a buyer is entitled to receive and how much honesty and candor is expected in the marketplace. The answer will depend on the nature of the transaction and the relationship of the parties. As a result, law relating to fraud is in a state of flux and contains few cut-and-dried answers.

Let's look at an example. I offer to sell the computer in the crate behind me, and I tell you that it is an IBM Personal System/2. After paying cash, you discover that the internals of the machine are actually from an 8088 microprocessor.

If I have intentionally lied, we have a classic case of fraud. If you don't believe that this kind of thing happens, note one case from the early 1980s where the seller demonstrated a prototype computer specially designed to run faster than the actual machine could ever operate.

If in my example I believed that machine was actually a PS/2 or I was not certain whether it was one, the tradition of buyer beware places the market risk on the buyer unless a contract specified that the machine was a PS/2. In a simple sale, that tradition applies, and the buyer loses.

Today, however, many courts provide buyers with a greater right to accurate information if they have requested and received advice from the seller and if the buyer is a novice while the seller is more expert. Although the buyer has a right to information, however, the seller is not compelled to ensure the accuracy of every piece of information important to the buyer. The limits of responsibility are subject to interpretation by courts and can be extremely hazy.

Some examples help illustrate. Suppose I realize that the system I am selling will be discontinued next month. If I neglect to tell you about it, am I guilty of fraud? One court said yes, if the parties contemplated a continuing relationship.

> BUYERS WHO ARE misled may have a legal remedy.

If I tell you that my system is compatible with particular software, but I am wrong, do you have a right to recover your payments from me or should you have called the software company yourself? Court rulings have gone in both directions on this question.

Suppose I tell you that the system has been fully tested, but I only tested a prototype. One court said this contention may be fraud.

If I claim that the new system will save you time and money, but it actually increases your cost of monitoring inventory, have I commited a fraud? Probably not. This sounds like permissible hype to me, and some courts have agreed.

Simple transactions place few obligations on the seller to disclose information and few limits on his freedom to hype his products. As the relationship of the involved parties becomes closer, or as the seller supplies more and more information, there are legal obligations to tell the truth and, in close relationships, to disclose information even if not asked.

The buyer must beware in today's marketplace, but buyers who are misled may have a legal remedy. So buyer beware: What looks like a good deal often isn't one. But seller beware too: A sales pitch may bring you more than you intended.

Nimmer is Foundation Professor of Law at the University of Houston, counsel to the law firm Sheinfeld, Maley & Kay and author of *The Law of Computer Technology* (Warren, Gorham & Lamont, New York).

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The BoCoEx index on used computers

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	Closing price	Recent high	Recent low
IBM PC Model 176	$500	$700	$400
XT Model 086	$700	$825	$700
XT Model 089	$775	$800	$600
AT Model 099	$1,225	$1,600	$1,200
AT Model 239	$1,500	$1,700	$1,200
AT Model 339	$1,600	$1,800	$1,500
PS/2 Model 50	$1,850	$2,200	$1,700
PS/2 Model 60	$2,425	$2,600	$2,400
Compaq Portable II	$1,700	$1,725	$1,550
Portable III	$2,400	$2,500	$1,900
Portable 286	$1,900	$2,000	$1,700
Plus	$750	$950	$675
Deskpro	$900	$1,200	$800
Deskpro 286	$1,525	$1,825	$1,300
Deskpro 386/16	$2,475	$2,750	$2,475
Apple Macintosh 512	$550	$750	$525
512E	$600	$890	$550
Plus	$950	$950	$650
II	$3,500	$3,800	$3,000

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Making the case for CASE

Introducing new methods calls for careful explanation of the transition

BY MARK DUNCAN
SPECIAL TO CW

Over the last few years, life has changed significantly for the system developer. He has had to forsake his terminal-to-mainframe environment for newfangled workstations and local-area networks.

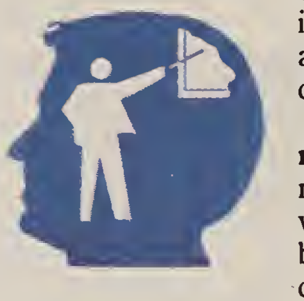
The stalwart, 20-year-old hierarchical database is being nudged aside by relational models. The entire development tool set is being superseded by computer-aided software engineering (CASE).

Much of the trauma, discomfort and aggravation associated with such change can be avoided by appropriate and timely preparation — in other words, by training. In the case of new development techniques, however, information systems management must realize that it is not sufficient merely to train staff members in the new approaches. There is a transition to consider: a detachment from former ways and a well-paced attachment to the new ones.

Training for this kind of transition calls for comparing the old with the new; doing so will let staff members not only perceive that change is imminent but gauge its scope and impact, too.

IS organizations switching from manual, paperbound development life cycles to CASE would do well to make comparisons of the following issues:

Life cycle phases and duration. Modern development methods, responding to demand for more speed, have compressed life cycle phases. The duration of the overall life cycle is also much shorter because there are fewer phases and fewer deliverables within them.



Phase overlap. The tendency with older development life cycles was to treat each phase discretely: The start of one depended on completion of the previous one. CASE has knitted the phases together more tightly — so much so that they overlap — with some deliverables residing in more than one of them.

Manual vs. automated techniques. Older methods were predominantly manual. Processes were paperbound, so the speed of approvals was governed by the rate at which paper moved among participants. As automation saturates development, encyclopedias and dictionaries will become central information repositories. This process will ease information sharing and speed up processes.

User involvement. User involvement in system development used to be confined to specific phases and isolated deliverables. Apart from establishing requirements and testing, users and developers accepted that development was the purview of technicians.

Two factors have changed this: The system development savvy of users has grown, and modern development methods enable them — indeed, require them — to participate more.

Increased effort in earlier phases. It used to be that the most intense effort in system development came in the latter phases of coding and testing. Experience and surveys have shown that the bulk of errors originate in the earlier phases of requirements, definition, analysis and design. CASE tools and techniques therefore concentrate on perfecting the quality of deliverables from these phases. Since code generators further diminish manual coding, developers and users must get used to development that is heavily loaded in the earlier phases.

Duplicated effort. Traditional development required new representations of system functions in each phase. Little that was completed in earlier phases could be used in creating subsequent deliverables. The result was duplicated effort.

The encyclopedias and dictionaries of application generators allow the one-time capture and reuse of information. Data captured during the definition of requirements is elaborated on and solidified into a design, which in turn feeds into a code generator.

Documentation. The creation of documentation has always been the most arduous of development tasks and, hence, the most susceptible to corner-cutting or total omission. Today, a CASE encyclopedia can release data for generating documentation such as user guides, system designs and technical manuals. The burden of revising documentation is also eliminated; simple regeneration ensures consistency between system features and documentation.

System modification. While developers admit it is natural for users to change requirements, they nevertheless begrudge them for doing so. New development life cycles still require thoroughness, but they also acknowledge the necessity for changes in requirements. They make change easier to accommodate, since system functions and parameters are stored in a central place. When one part of a system is modified, all components affected by it automatically access the new value.

Change is hard — even change for the better. It is particularly hard for system developers because of its breakneck pace in their field. Giving appropriate consideration to transition training will help them absorb change and perhaps even support it.

Duncan is a quality assurance consultant at a large Dallas bank.

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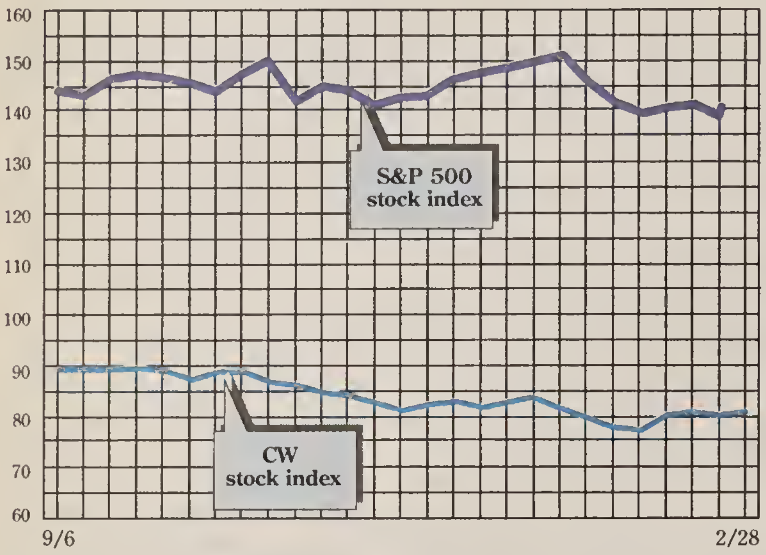

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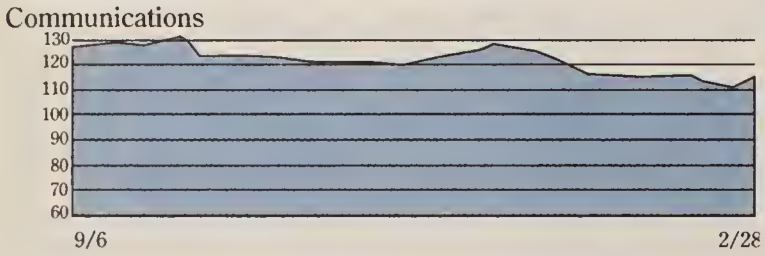
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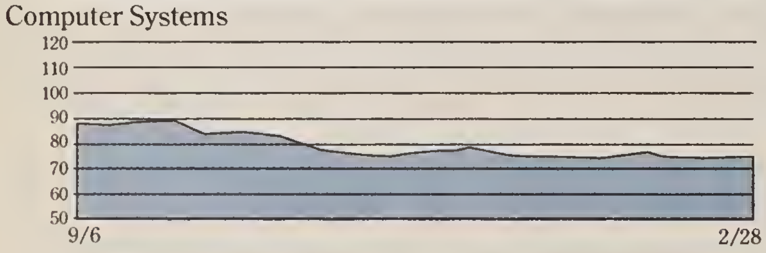
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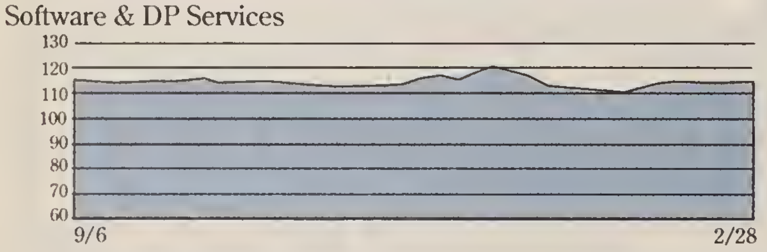
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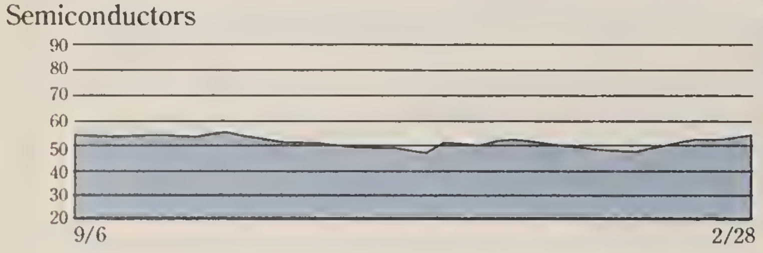
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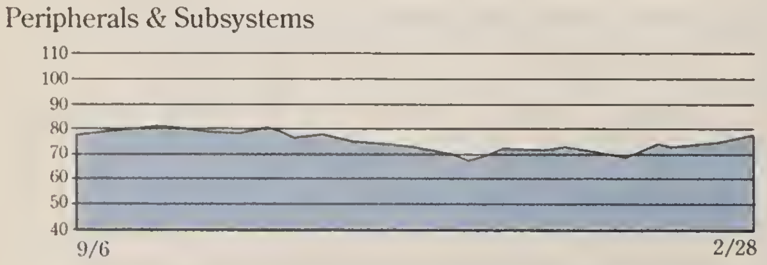
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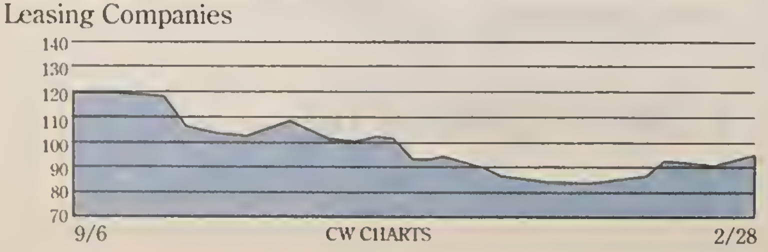

Leasing Companies

CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEB. 28, 1990

Communications and Network Services

EXCH		52-WEEK RANGE		PRICE CLOSE FEB. 28 1990	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	68	50	57.75	1.8	3.1
Q	ANDREW CORP	26	18	22	-1.3	-5.4
Q	ARTEL COMM CORP	9	3	7.5	0.0	0.0
N	AT&T	47	30	39.75	1.0	2.6
Q	AVANTEK INC	7	2	2.5	0.3	11.1
N	AYDIN CORP	21	14	14.75	-0.1	-0.8
N	BELL ATLANTIC CORP	114	72	89.875	3.1	3.6
N	BELLSOUTH CORP	59	40	52.375	0.9	1.7
Q	COMPRESSION LABS INC	13	4	12	1.0	9.1
Q	CONTEL CORP	37	23	27.625	1.3	4.7
Q	DATA SWITCH CORP	6	2	1.938	-0.3	-13.9
Q	DIGITAL COMM ASSOC	25	17	19	-0.3	-1.3
Q	DYNATECH CORP	21	16	15.75	0.3	1.6
Q	FIBRONICS INTNL INC	7	4	5.75	0.1	2.2
Q	GANDALF TECHNOLOGIES	7	3	3.063	0.3	11.4
N	GENERAL DATACOMM INDS	7	4	4.125	-0.1	-2.9
N	GTE CORP	72	44	61	2.0	3.4
Q	INFOTRON SYS CORP	13	6	7	0.5	7.7
N	ITT CORP	65	51	54.875	1.4	2.6
N	M A COM INC	9	4	4.5	0.0	0.0
Q	MCI COMMUNICATIONS CORP	49	25	34.375	3.4	10.9
N	NETWORK EQUIP TECH INC	32	19	29.125	-1.5	-4.9
Q	NETWORK SYS CORP	11	7	10.75	0.3	2.4
N	NORTHERN TELECOM LTD	25	14	24.25	1.1	4.9
Q	NOVELL INC	38	24	36.25	1.3	3.6
N	NYNEX CORP	92	68	79.875	2.9	3.7
N	PACIFIC TELESIS GROUP	52	33	44.125	2.1	5.1
A	PENRIL CORP	9	4	6.375	-0.1	-1.9
N	SCIENTIFIC ATLANTA INC	25	14	21.125	0.0	0.0
N	SOUTHWESTERN BELL CORP	65	44	54.75	2.1	4.0
Q	3 COM CORP	29	10	12.125	0.3	2.1
N	U S WEST INC	81	59	68.875	0.6	0.9

Computer Systems

Q	ALLIANT COMPUTER SYS	8	3	6.75	-0.6	-8.5
Q	ALPHA MICROSYSTEMS	8	4	3.875	0.0	0.0
Q	ALTOS COMPUTER SYS	8	5	5.25	0.0	0.0
A	AMDAHL CORP	23	11	14	0.1	0.9
Q	APPLE COMPUTER INC	50	32	34	0.0	0.0
N	BOLT BERANEK & NEWMAN	10	5	6	0.1	2.1
N	COMPAQ COMPUTER CORP	113	65	84.25	0.9	1.0
N	COMMODORE INTNL	20	7	8.25	0.3	3.1
Q	COMPUTER AUTOMATION INC	6	2	3.25	0.4	13.0
N	CONTROL DATA CORP	24	16	17.5	1.0	6.1
N	CRAY RESH INC	61	31	47.5	1.0	2.2
Q	DAISY SYS CORP	5	0	0.5	-0.1	-11.2
N	DATA GEN CORP	19	8	8.75	0.0	0.0
N	DATAPOINT CORP	6	2	2.125	-0.5	-19.0
Q	DELL COMPUTER CORP	9	5	6.25	0.3	4.2
N	DIGITAL EQUIP CORP	114	70	78	5.1	7.0
N	FLOATING POINT SYS INC	4	1	1.5	0.0	0.0
N	HARRIS CORP	40	27	29	-1.3	-4.1
N	HEWLETT PACKARD CO	58	40	43.125	1.0	2.4
N	HONEYWELL INC	92	62	82.5	5.9	7.7
N	IBM	122	93	103.875	-1.0	-1.0
Q	INFORMATION INTL INC	16	12	12	-0.3	-2.0
Q	IPL SYS INC	9	5	8.5	1.6	23.6
N	MAI BASIC FOUR INC	10	2	2.875	0.0	0.0
N	MATSUSHITA ELEC INDL LTD	186	136	144.25	-2.4	-1.6
Q	MENTOR GRAPHICS CORP	22	14	16.625	0.6	3.9
N	NBI INC	3	0	0.344	0.0	0.0
N	NCR CORP	71	53	68.75	1.1	1.7
Q	PYRAMID TECHNOLOGY	27	9	26	1.9	7.8
Q	SEQUENT COMP SYS INC	23	10	21.25	1.3	6.3
Q	SHAREBASE CORP	3	0	0.5	-0.1	-11.2
Q	SUN MICROSYSTEM INC	23	13	22.375	1.4	6.5
Q	SYMBOLICS INC	3	1	0.938	0.1	15.4
N	TANDEM COMPUTERS INC	29	15	27.5	-0.3	-0.9
N	TANDY CORP	49	32	31.875	-0.3	-0.8
N	ULTIMATE CORP	12	6	6	-0.5	-7.7
N	UNISYS CORP	29	12	14.125	-0.3	-1.7
A	WANG LABS INC	10	4	4.875	0.8	18.2

Software & DP Services

Q	AMERICAN MGMT SYS INC	18	11	12.125	0.5	4.3
Q	AMERICAN SOFTWARE INC	23	12	18.625	-0.8	-3.9
N	ANACOMP INC	8	3	3.5	0.0	0.0
Q	ANALYSTS INTL CORP	20	11	16.5	0.5	3.1
Q	ASHTON TATE	24	9	11.875	0.9	8.0
Q	ASK COMPUTER SYS INC	17	7	9	0.1	1.4
N	AUTO DATA PROCESSING	51	36	50.25	0.5	1.0
Q	AUTODESK INC	46	27	44.25	-1.0	-2.2
Q	BMC SOFTWARE INC	33	15	30.75	0.5	1.7
N	BUSINESSLAND INC	14	7	9.125	2.1	30.4
Q	COGNOS INC	8	4	4.5	0.1	1.4
N	COMPUTER ASSOC INTL INC	22	11	12	-0.6	-5.0
Q	COMPUTER HORIZONS CORP	11	7	9	0.3	2.9
N	COMPUTER SCIENCES CORP	59	44	44.625	-2.9	-6.1
N	COMPUTER TASK GROUP INC	16	9	9.5	-0.1	-1.3
Q	COMSHARE INC	42	24	35.875	-0.6	-1.7
Q	CORPORATE SOFTWARE	16	8	10.5	-0.3	-2.3
N	GENERAL MTRS (CLS E)	58	43	53.125	0.9	1.7
Q	HOGAN SYS INC	7	4	3.938	-0.2	-4.5
Q	INFORMIX CORP	17	8	12.625	-0.3	-1.9
Q	INTELLICORP INC	6	3	5	0.0	0.0
Q	LEGENT CORP	32	21	27.125	0.9	3.3
Q	LOTUS DEV CORP	34	19	31	2.5	8.8
Q	MICROSOFT CORP	101	46	98.75	2.6	2.7
Q	NATIONAL DATA CORP	35	25	28	-1.0	-3.4
N	ON LINE SOFTWARE INTL INC	11	5	8.25	0.0	0.0
Q	ORACLE SYS CORP	26	11	22.375	0.0	0.0
N	PANSOPHIC SYS INC	19	12	16.5	1.8	11.9
Q	PHOENIX TECHNOLOGIES INC	18	3	3.25	-0.1	-3.7
Q	POLICY MGMT SYS CORP	38	22	33.5	-0.3	-0.7
Q	PROGRAMMING & SYS INC	22	16	17.625	0.6	3.7
Q	RELATIONAL TECH INC	16	5	7.875	-0.4	-4.5
N	REYNOLDS & REYNOLDS CO	34	19	19.75	-0.3	-1.3
Q	SAGE SOFTWARE INC	11	7	11.25	1.8	18.4
Q	SEI CORP	20	15	16	0.5	3.2
Q	SHARED MED SYS CORP	19	12	13.75	0.9	6.8
Q	SOFTWARE PUBG CORP	21	10	18	-0.3	-1.4
A	STERLING SOFTWARE INC	9	5	8.625	-0.3	-2.8
Q	SUNGARD DATA SYS INC	26	13	20.75	0.5	2.5
Q	SYSTEMATICS INC	40	30	29.75	0.3	0.8
N	SYSTEM CENTER INC	26	18	22.25	-1.0	-4.3
N	SYS. SOFT INC	25	12	23	-0.3	-1.1
Q	WORDSTAR	3	1	0.75	-0.1	-14.3

Semiconductors

N	ADV MICRO DEVICES INC	11	7	8.25	0.8	10.0
N	ANALOG DEVICES INC	12	7	8.125	0.1	1.6
Q	ANALOGIC CORP	11	8	9.875	0.0	0.0
Q	CHIPS & TECHNOLOGIES INC	26	14	21.5	2.0	10.3
Q	INTEL CORP	42	23	40.25	1.4	3.5
Q	MICRON TECHNOLOGY INC	26	7	12.125	1.9	18.3
N	MOTOROLA INC	64	40	61.75	3.9	6.7
N	NATL SEMICONDUCTOR	9	5	7	1.0	16.7
N	TEXAS INSTRS INC	47	28	35.25	3.0	9.3
A	WESTERN DIGITAL CORP	15	6	9.5	0.5	5.6

Peripherals

Q	ALLOY COMP	3	1	1.407	-0.3	-19.6
N	AM INTL INC	6	3	3.75	0.1	3.4
Q	AST RESH INC	16	7	15.875	1.1	7.6
Q	AUTO TROL TECH CORP	6	3	3.375	0.1	3.8
Q	BANCTEC INC	20	11	18.5	0.5	2.8
Q	CIPHER DATA PRODS INC	11	4	7.375	-0.1	-1.7
A	COGNITRONICS CORP	8	3	4.875	0.0	0.0
Q	CONNOR PERIPHERALS	17	7	16.125	0.4	2.4
A	DATAPRODUCTS CORP	18	6	5.875	-0.1	-2.1
A	DATARAM CORP	13	8	11.875	0.1	1.1
N	EASTMAN KODAK CO	52	37	37.625	-0.4	-1.0
N	E M C CORP MASS	6	3	5.25	0.1	2.4
Q	EMULEX CORP	12	5	5.25	0.1	2.4
Q	EVANS & SUTHERLAND	26	17	25	0.5	2.0
Q	ICOT CORP	3	1	1.5	0.0	0.0
Q	INTERLEAF INC	10	5	5.75	0.0	0.0
Q	IOMEGA CORP	4	2	3.938	0.4	12.5
Q	LEE DATA CORP	4	1	1.5	0.0	0.0
Q	MASSTOR SYS CORP	4	1	1.75	0.3	21.7
Q	MAXTOR CORP	12	7	10.75	0.3	2.4
Q	MICROPOLIS CORP	8	3	5.375	0.0	0.0
N	MINNESOTA MNG & MFG CO	84	65	80.125	2.8	3.6
Q	PERSONAL COMP PRODUCTS INC	6	4	4.125	0.0	0.0
Q	PRINTRONIX INC	11	7	10.75	0.1	1.2
N	QMS INC	15	7	13.875	-0.1	-0.9
Q	QUANTUM CORP	17	5	11.5	0.8	7.0
N	RECOGNITION EQUIP INC	13	6	6.375	0.1	2.0
Q	REXON INC	8	6	7.5	0.4	5.3
Q	SEAGATE TECHNOLOGY	20	9	18.5	0.0	0.0
N	STORAGE TECH CORP	23	9	17.75	1.1	6.8
Q	TANDON CORP	2	0	1.438	0.3	27.8
N	TEKTRONIX INC	24	13	13.375	-2.0	-13.0
Q	TELEVIDEO SYS INC	1	0	0.313	0.0	0.0
N	XEROX CORP	69	50	51.5	0.3	0.5

Leasing Companies

Q	AMPLICON INC	115	8	9.375	0.0	0.0
N	CAPITAL ASSOC INTNL INC	9	3	3.25	0.0	0.0
N	COMDISCO INC	34	21	23.75	1.3	5.6
Q	CONTINENTAL INFO SYS	2	0	0.406	0.1	18.0
Q	LDI CORPORATION	18	13	14.25	0.3	1.8
Q	PHOENIX AMERN INC	5	3	3.625	0.4	11.5
Q	SELECTERM INC	9	6	5.75	-0.1	-2.1

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL

Tokyo woes

Darkness covers Nikkei index as U.S. technology stars shine

The Land of the Rising Sun grew dark last week — at least to observers of Japan's Nikkei stock average. After its second-biggest drop ever of 4.5% on Monday, the Nikkei lost another 2.2% Thursday to close at 33829.58 points.

Analysts feared the slide would yank the Dow Jones industrial average down with it, but investors proved there was nothing to worry about — especially among technology issues. Whispers of a possible takeover of Digital Equipment Corp. by Japan's Mitsubishi Electronic Corp. helped propel DEC stock up a stunning 6 points Wednesday (see story page 4). Prices dipped 3 points on Thursday as DEC officials denied the rumor; DEC ended the week up 3⅞ points at 74½.

Motorola, Inc. won big in the semiconductor arena, climbing 3⅝ points to end the week at 60⅝. Texas Instruments, Inc. followed suit, grabbing 3⅛ points to close at 35⅝; Intel Corp. finished at 40⅝, up 2 ⅛.

The software sector also rose. After unveiling its new spreadsheet for IBM mainframes, Lotus Development Corp. jumped 3 points, reaching 31½ by Thursday's close (see story page 12). IBM joined in with a gain of 1⅝, ending at 104.

KIM S. NASH

NEWS SHORTS

Morris sentencing scheduled

Robert T. Morris, the ex-Cornell University graduate student who was convicted in January of putting a worm program into a nationwide computer network, lost another legal round last week when U.S. District Judge Howard Munson denied his posttrial motions. A hearing for sentencing has been set for May 4 at a federal district court in Syracuse, N.Y. Ellen Meltzer, one of the U.S. government attorneys in the case, said prosecutors will make a recommendation for sentencing about one week before the hearing. She declined to say what the government will recommend. Morris could be imprisoned for up to five years, fined up to $250,000 and ordered to make restitution to those victimized by his worm program.

……

3Com enlists in forum

Local-area network giant 3Com Corp. joined the OSI/Network Management Forum last week as an associate member, along with BBN Communications Corp., Telematics International, Touch Communications, Inc. and five other companies. That brings the total membership to 93 for the Forum, whose role is to accelerate the maturation and implementation of Open Systems Interconnect network management standards. Also last week, the organization released an architecture document that defines relationships between different network management elements and a glossary that defines terms used in the development of specifications.

……

A return to outsourcing

Sprague Technologies, Inc., a Fortune 500 electronics firm in Stamford, Conn., which brought its processing in-house from a service bureau five years ago, is going back outside. Sprague has signed a three-year contract with Martin Marietta Information Systems Group to outsource all of its corporate information systems operations. Sprague will retain its applications development functions.

……

Compaq offers small-footprint 386

Targeting heavy-duty business users with limited desktop space, Compaq Computer Corp. is launching its Compaq Deskpro 386/25e this week. Sporting measurements of 5.9 by 14.8 by 15.8 in., the new box was specifically designed to fit on a credenza. Reported features include a 25-MHz Intel Corp. 80386-based microprocessor, 4M bytes of standard memory, fixed disk drives and integrated Video Graphics Array capabilities. The unit will supplement, not replace, existing 80836 product line offerings, the company said, and it will be priced from $6,499 to $8,499, depending on memory configuration.

……

U.S., Japan reach accord

Japanese and U.S. trade officials last week reached an agreement to revise the language contained in a 1987 trade accord on supercomputers that will give U.S. companies better access to the Japanese market. The action comes just one week before a hastily called trade meeting between President Bush and Japanese Prime Minister Toshiki Kaifu and is the first sign of movement on the supercomputer trade issue since the U.S. cited Japan last year under the so-called Super 301 provision of the 1988 Trade Act — saying that Japanese rules make it difficult for foreign vendors to compete.

……

Vendors join forces on LCD

A group of electronics vendors is exploring the creation of an industry consortium to drive LCD technology and so prevent Japanese hegemony in this field, officials involved with the venture said last week. The attempt bears a strong similarity to the effort to create U.S. Memories, a consortium which intended to produce microchips but died from lack of funds in January. One member of the LCD group is the David Sarnoff Research Center in Princeton, N.J., a developer of a so-called active-matrix LCD. In active-matrix LCDs, such as the one used on the Apple Computer, Inc. portable Macintosh, each pixel is controlled by its own silicon transistor. This approach makes for faster, higher contrast displays.

IS top gun has no plans to leave

BY AMY CORTESE
CW STAFF

NEW YORK — Amid reports of an impending departure from Merrill Lynch & Co., DuWayne J. Peterson, the firm's million-dollar information chief, last week insisted he has had no thoughts of leaving.

Merrill Lynch's Peterson

In an interview last week with *Computerworld*, Peterson, executive vice-president of operations/systems and telecommunications at the financial firm, said he was "here for the duration."

Disputing recent reports that asserted Peterson was out of favor at Merrill Lynch and might return to California, a spokesman for the company said Peterson "has been a leading contributor to the success of Merrill Lynch."

Among Peterson's accomplishments, the spokesman cited a major consolidation of the firm's data center operations and the negotiation of a telecommunications contract with MCI Communications Corp., which together stand to save Merrill nearly $50 million annually.

Peterson said the employment contract he signed with Merrill upon joining the company expired last June but that he would continue with the firm.

The high-profile Peterson joined Merrill in 1986, after serving as executive vice-president of California-based Security Pacific Corp.'s automated data processing group, where he spearheaded development of the bank's pioneering electronic banking systems.

Under Peterson's guidance, Merrill has aggressively pursued the benefits of outsourcing — contracting out certain operations to third parties. A major telecommunications services contract with MCI was followed by a highly publicized agreement with IBM and partner MCI to take over the massive task of managing Merrill's vast communications networks.

"IBM came on strong with MCI," Peterson recalled, and "the price looked good." However, when members of Merrill's network management staff started to leave, fearing a loss of control to IBM, Peterson backed off from the initial letter of intent he signed with IBM. The proposal is still under consideration, but "we are really soft-pedaling it," Peterson said.

Downsizing

FROM PAGE 1

migration can indeed result in downsizing the IS department: Consolidated now has an IS department of 10 instead of 30. However, companies interviewed were unanimous in emphasizing the value of their IS managers both during and after the migration.

"We found that we [still] tend to hire people with mainframe backgrounds because we want to keep the same skill sets and keep on the LAN the same controls and structure we had on the mainframe," said Steve Gold, manager of systems and programming at Echlin.

One year into its 3½-year plan to move all operation systems from a Bull H. N. Information Systems, Inc. DPS92 mainframe to networked personal computers, Homequity has only lost two of its 85 IS staffers, Calcagni said.

It could certainly be argued that Homequity's IS managers feel less threatened because they are not being entirely forced off the mainframe, which will continue to house the master database as well as financial applications that require a lot of number crunching. However, the IS managers are actually expressing a preference for working on PCs instead of the mainframe, Calcagni said: "It's sort of a privilege."

Privileged or not, Homequity's IS department has played a pivotal role in the executive relocation firm's migration, Calcagni said. In particular, IS has been working on a utility package that ensures all LAN applications get mainframe-quality maintenance, backup and security.

According to Calcagni, not only Homequity's IS managers, but also its users, are taking downsizing in stride, primarily because they can make the move at their own speed. "We don't coerce," he said. Meanwhile, IS developers are being encouraged to "get on the road and see users," and are being offered training in "how to think like and deal with users, which has always been difficult," he added.

> "THE BIGGEST benefit I see is that I have autonomy to manage not only my people but my systems and information."
>
> JOSEPH MCNALLY
> CONSOLIDATED

One of the most important new roles that downsizing creates for IS, managers reported, is helping users take advantage of — without abusing — the greater autonomy LANs offer. This can be a tough job, particularly since IS departments "don't always have a warm relationship with users," said Ronald Peri, president of Computer Support of North America, a Basking Ridge, N.J., systems integrator.

In addition, IS' perception of downsizing to LANs "as a chance to regain control of PCs" can run head-on into users' hopes that LANs will "provide them with freedom from IS," Peri said.

At least one user supported this. "The biggest benefit I see [to downsizing] is that I have autonomy to manage not only my people but my systems and information," said Joseph McNally, a controller at Consolidated. "What always annoyed the hell out of me as a middle manager was having to grapple with programmers and DP personnel, who think they've got you. I always figured ways around them, to get what I needed."

With IS and users working more closely in a PC LAN environment, many companies are appointing a liaison to help foster good relations between the two groups. Georgiana Flanagan, who holds the liaison position at Consolidated, spends her time refereeing disputes between IS and users, making users' application needs clear to IS and coaxing users onto the LAN-based systems. "Some [users] fight you tooth and nail, so we sit down and spend a week coming up with things they want," she said.

Difficult as the transition may be, however, IS managers who cooperate with — or better still, lead — their companies' downsizing efforts can find rich rewards. Wayne Read, who spearheaded Consolidated's downward move to LANs, is a senior systems programmer who now heads the firm's data processing department. Gold, who sparked the downsizing strategy at Echlin, also shot up from senior programmer status to head of the IS department.

As of next week, however, Gold will be leaving Echlin to found Microquest, a consulting firm that will help other firms in their downsizing efforts.

Anxiety

FROM PAGE 1

computer screens.

The systems problems result in "delays, diversions and, in the worst possible case, accidents," said John Mazor, a spokesman for the Airline Pilots Association, based in Washington, D.C. "It's not as dangerous as you might think, but it's not something you want to have happen to you," he said.

The problem is overloaded computers — mostly the 15-year-old Sperry Corp. Univac 8303 processor, a military computer based on 30-bit architecture. The computers, known as Automated Radar Terminal Systems (ARTS), are installed in Terminal Radar Approach Control centers, where controllers sequence and separate aircraft for landings and takeoffs.

Those units will eventually be replaced by a reduced instruction set computing (RISC)-based architecture from IBM. In the meantime, Unisys Corp. is adding solid-state memory, at a cost of $45 million, to 71 capacity-strained control centers.

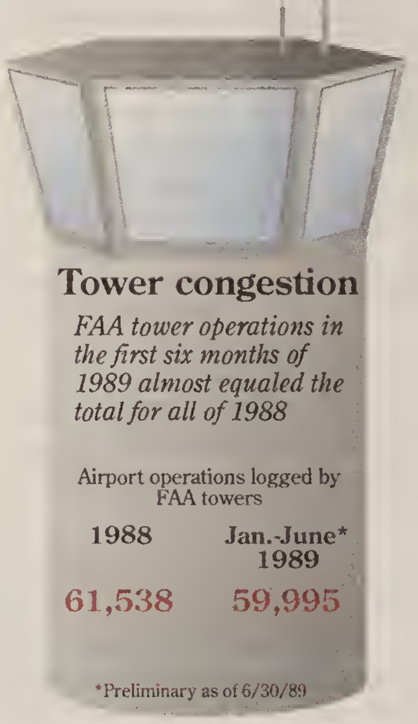
This year, Unisys said it expects to win another contract, worth $150 million, to provide more 30-bit computers by either refurbishing salvaged machines or opening up an old production line.

"ARTS initially was designed by Univac in the early 1970s to be modularly expandable. We're doing that expansion," explained Michael E. Perie, deputy director of the Federal Aviation Administration's (FAA) automation service. Replacing the core memories with solid-state memories "buys us back a lot of computer capacity," Perie added.

Unisys was awarded the sole-source contract to avoid rewriting software for today's 32-bit computer architecture. "There was a massive amount of proven software that would not be portable," said Jim Overocker, Unisys' program manager for the FAA's interim support plan.

Just how "proven" existing software may be is a matter of dispute. The software "is stuck in 1960s hardware," Willemssen said. "That's certainly not ideal."

However, according to Joe Loefflad, the FAA's acting manager for national terminal field support and maintenance, software upgrades on the 20-year-old system could serve the FAA up to the year 2000, in case the next generation of air traffic control systems, the Advanced Automation System (AAS), is that late.



Tower congestion

FAA tower operations in the first six months of 1989 almost equaled the total for all of 1988

Source: Aviation Management Systems
CW Chart: John York

After the upgrades are disseminated, the FAA's Atlantic City Technical Center issues patches for their shortcomings. Patches are tested both in the field and at the Tech Center, according to Loefflad. There are differing opinions on the efficacy of the test center's test configuration, however.

The largest controller stations, such as Dallas-Fort Worth's, have over 20 displays; the Tech Center has eight. According to the Aircraft Owners and Pilots Association (AOPA) — the organization of noncommercial owners — the Tech Center is lacking because it does not match field configurations. Loefflad said, however, that with the installation of switches, it has the capacity of 25 displays — one more than exists at any control station.

Loefflad blamed a CPU overload at Dallas-Fort Worth in October 1989 on a patch developed at the control tower, even though it had been tested at the Tech Center. The person applying the patch, however, made the entry from a computer that was to be taken off-line, thus causing a nearly 20-minute loss of information on controllers' screens, Loefflad said.

However, Stephen Bassett, senior vice-president of government and technical affairs at the AOPA, is much more suspicious that the FAA's Tech Center testing configuration did not in fact match Dallas-Fort Worth's configuration, even with the inclusion of display switches.

As a practical matter, the Unisys addition of refurbished CPUs and solid-state memory is expected to last until all of the systems are replaced by the AAS, under development by IBM, which will perform nearly all air traffic control functions.

However, the interim upgrade is merely a crutch "just to keep crippling along," GAO evaluator Sara Magoulick said.

Clinging to its old computers — not only the 30-bit machines, but other radar-gathering and data-filtering units that are still based on vacuum tubes — makes it problematic for the FAA to get components to work together, according to Warren Zentz, vice-president of Region 1 (Chicago) Professional Airways Systems Specialists, the union of computer maintenance workers. "You hook the old crap to the new crap, and you get crap," he said.

AAS is purported to be the long-range cure for all of the computer problems plaguing the nation's air traffic system. Begun in 1984, it is intended to increase controller productivity, reduce operating costs, save fuel and passenger time and allow controllers to handle anticipated air traffic increases more safely and efficiently.

Simply put, AAS will replace aging air traffic control systems with new hardware, software and controller workstations. The FAA awarded the $3.6 billion contract to IBM in July 1988. According to IBM, it is the largest contract the company has ever received.

One of the first phases of the AAS will be new controller workstations. These workstations will have two high-resolution monitors capable of displaying weather, radar and other important data in color. The displays will replace monochrome radar monitors built in the early 1970s, which have been reliable but are "getting harder to maintain," Perie said.

Air traffic *controller monitors under development by IBM*

The main reason for replacing the monitors is to be able to use color to show weather data and "alerts," as well as to provide other automated aides for controllers.

From the controller's point of view, one the biggest changes will be the replacement of stacks of paper "flight strips," on which controllers record flight-progress data, with an automated system.

Installation of the new controller workstations was scheduled to begin in 1993, but that schedule slipped early in development and threatens to cause a delay in the whole AAS project.

Perie said the delay has been caused by two problems.

First, several human factors, such as designing the automated version of the paper flight strips, have taken longer than expected to resolve and translate into software.

Second, the software programming effort, which uses the Ada programming language, is going slowly.

"The compilers aren't as efficient as we would like, and the support environment is not where we would like it to be," Perie said. The project requires two million lines of new code, according to IBM.

While the flying public waits for the new system, and Unisys gears up to add interim capacity, air traffic faces hurdles posed by the Band-Aid approach.

"Every day, we fall further behind," Mazor said. With system capacity restrictions, airplanes have to be held farther and farther apart so that flight information does not overtax the CPU. The result is fewer flights and increased delays.

Once the FAA committed itself to the AAS program, it "made no effort to get out of the box they painted themselves into," GAO evaluator Andrea Leopold said. The original estimate of having the AAS in place by 1992 was not a bad one, she said, but little has been done to make sure the current systems could last beyond 1992, in the now likely event that the AAS is late.

Martin Pozesky, assistant administrator of the FAA's modernization program — of which the AAS is the major systems component — said the FAA had not measured capacity at the control centers while it was developing the AAS plan. When the FAA discovered it was becoming capacity-constrained, it began the Unisys contract. "It will buy us a 20% to 30% increase in capacity," he said.

The airlines estimate that FAA inefficiencies cost travelers $3 billion per year, in addition to the intangible frustrations of missed connections.

"There is a trade-off between safety and efficiency," said Drew Steketee, executive director at the Partnership for Improved Air Travel in Washington, D.C., a travelers' lobbying group. "To hold safety constant, they had to reduce efficiency — including the separation of airplanes."

Pilots and controllers have not been publicly distraught over CPU overloads, apparently because the two groups are used to "winging it."

"We're conditioned to make it work, to power through," Mullin said.

Those groups may also feel overwhelmed after watching the FAA's modernization plans suffer continual setbacks for the past nine years. "It's temporary relief, not a long-term solution," Mazor said.

Despite grand plans to modernize the FAA's infrastructure, little has been done in the last decade. The flying public enters the 1990s still relying on vacuum tubes and the vagaries of crowds expected for sporting events.

"When the government decided to [deregulate], it did not see the need to invest in the aviation infrastructure to accommodate the vast growth in demand," Steketee said.

National Correspondent Mitch Betts and West Coast Senior Correspondent James Daly contributed to this report.

'You are too close'

Taking air traffic control into their own hands, commercial airlines, through the Air Transport Association of America, will install a Traffic Alert and Collision Avoidance System in the nation's 4,000 commercial airplanes during the next few years.

An on-board computer to back up air traffic controllers will let commercial airline pilots know if they are too close to other planes.

The system will emit a voice warning to pilots if another plane is within the plane's safety airspace. If the planes get too close, the system will recommend ascending or descending to avoid collision.

The U.S. General Accounting Office, Congress' investigative arm, is not entirely pleased with the idea. According to Allen Li, assistant director of aviation for the agency, it would rather see air traffic control remain on the ground — in the hands of the Federal Aviation Administration — despite the administration's slow implementation of modernization plans.

J. A. SAVAGE

European skies court tragedy

BY AMIEL KORNEL
CW STAFF

Europe's massive air traffic control problems dwarf those confronting the U.S. Antiquated information systems and communications systems used by many of the continent's 22 national flight control networks are being severely taxed by a recent surge in traffic, experts say.

Airlines and the public, which are already bearing the multibillion-dollar annual cost penalty of the system's inefficiencies, could soon find themselves obliged to choose between air-transport paralysis and reduced safety.

"Europe has reached a point of saturation," said Larry Fortier, an air traffic control consultant based in Arlington, Va.

Due to system incompatibilities, flight plans and data can rarely be transmitted to another country automatically. They generally are sent over teletype and then keyed into local computers. Radar data, when it exists, also cannot be sent digitally.

For handoff of aircraft over international boundaries, controllers in different countries still communicate over dedicated phone lines. Although once adequate, voice communication no longer affords the responsiveness necessary for maintaining an efficient — and safe — flight control network, experts say.

"Sometimes when traffic is heavy, you can't even reach the other guy," said Wil Koper, chairman of the legal matters committee at the International Federation of Air Traffic Controllers Associations. Playing telephone tag, he said, "is a waste of time, and in some cases it might even endanger air traffic control. If you have an emergency or a case where you have to get a plane down right away, you have to push a button and wait for a guy to pick up the phone."

In some areas of Europe, he pointed out, a plane may cross three or four international borders within 10 to 12 minutes. Coordinating an emergency landing by telephone could become hellishly complicated, Koper said, although he was unable to provide examples of specific occurrences.

"To resolve a problem," said Don Bull, system director of flight control at Pan American World Airways, "sometimes requires several phone calls to different centers."

The situation is no less frustrating for the controller on the receiving end. "If three calls come in at once, how does he know which to take first?" asked Douglas Spragg, air traffic control expert at Eurocontrol, a transnational body based in Brussels that is responsible for furthering air navigation safety.

Growing congestion in the skies over Europe has exacerbated the continent's air traffic control problems. While the number of flights rose at a 2.5% annual rate between 1974 and 1986, it jumped 7.8% in 1987 and 8.9% in 1988. Total air traffic is expected to double by the year 2000 as compared with 1987, according to the U.N.-affiliated International Civil Aviation Organization in Paris.

In addition to the safety issues, recent independent reports have detailed how Europe's incompatible and outdated national systems cost airlines and passengers billions of dollars per year.

"The system is ramshackle and inefficient," said John Parr, head of the Air Transport User's Committee in London.

No less than 22 independent national systems are operated out of 44 en route flight control centers, while in the U.S., a single system comprising 20 centers covers about twice as much territory and roughly the same number of flights.

Air traffic control services in Europe cost more than three times as much as comparable services in the U.S., according to a study released in September 1989 by the Association of European Airlines in Brussels. The study estimated that a technically efficient system could get the job done with only six en route centers.

Delays and inefficiencies cost the airlines, passengers and taxpayers a total of $4.2 billion in 1988, according to the study, prepared for the association by Gellman Research Associates, Inc. in Jenkintown, Pa. About half the amount is due to redundant air traffic control operations and the cost of delays to both airlines and passengers.

Despite the warnings, European politics threaten to frustrate efforts to harmonize the continent's hodgepodge of air traffic control systems. Recent calls for the creation of a streamlined, unified network are likely to go unheeded, insiders predicted. As usual in Europe, they say, sovereignty rules over sanity.

Political red tape

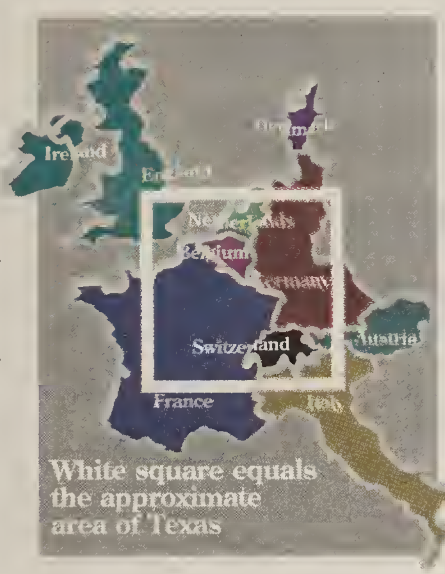
Citing the political issues involved, Jude Mariadassou, technical officer at the 23-nation European Civil Aviation Conference, said he did not believe that one could "reasonably" expect a single unified system.

"It's no secret that forces in the bureaucracies of the states don't want to give up their sovereignty," said Karl-Heinz Neumeister, secretary general of the Association of European Airlines.

What is more, said Daniel Oudin, chief of the air traffic control section at the International Civil Aviation Organization, the defense establishment in each country prefers preserving national dominion of the skies so that dissemination of information about aircraft movements can be controlled.

International block

Europe's air traffic control is complicated by national boundaries requiring quick flight handoffs by national control centers



CW chart: John York

FAA may outsource in attempt to keep ahead

ON SITE

BY J. A. SAVAGE
CW STAFF

OKLAHOMA CITY — Every year, the Federal Aviation Administration's centralized data services department explains to Congress, once again, why it needs more money to buy a bigger CPU.

This year, though, the facility that handles the FAA's data processing for everything other than air traffic is not going to Congress. Instead, the bureaucracy is experimenting with the same method of saving the annual begging session as private industry — outsourcing.

At the Mike Monroney Aeronautical Center here, the FAA chronicles pilots, keeps statistics on airplane trade, teaches air traffic control to phalanxes of students and teaches aircraft maintenance to technicians.

Nearly all of the center's administrative work is done on one IBM 3084 mainframe and 22 Data General Corp. MV/15000 computers, running a total of 23,000 programs. Currently, demand on the central mainframe increases 30% per year.

The contract was originally supposed to be awarded this month, according to the FAA, at a price expected to be somewhere in the $1.5 billion range. It has been put off until midyear.

Meanwhile, the current computers are overloaded, and staff has little confidence that this outsourcing contract will result in upgrades in the near future.

Leo Epperson, assistant manager of data services in the FAA's administrative headquarters, said that a contract that large is likely to draw litigation and thus delay installation. Originally, the FAA decided that it would avoid sending conflicting messages to vendors and thus did not ask Congress to upgrade its current IBM 3084 mainframe, which is already at 86% capacity.

More recently, Epperson said the FAA is going ahead on interim procurement of an IBM 3090 Model 300-class mainframe.

Until then, the staff is expecting a five-second or less response time, according to Bill Beavers, manager of the data services division.

The 10-year program, called Computer Resources Nucleus Project (CORN), would be a relief for Beavers, as he would no longer have to ask Congress for more money. The current method of upgrading depends on those annual appropriations.

Even after Congress lets go of the money, it takes nearly two years before a new CPU is installed, according to Beavers. This exacerbates the second most nagging problem facing Beavers — trying to fund on-staff positions.

Not only is the FAA short on personnel to run its data center, but it is also short on personnel to oversee the implementation of CORN. It is currently considering hiring a systems integrator, at an estimated cost of $35.5 million, to help manage the implementation of CORN and other administrative systems.

While the current staff is proud of what it can do with increasingly limited resources, its ability to provide information to researchers looking into the cause of an accident, for example, is limited to paper or microfiche files. There is no database other than a simple name and reference file. "We're automated and antiquated at the same time," said Ron Johnson, a program analyst.

For instance, the aviator registry has three million entries on microfiche. "You can go back to Amelia Earhart," Epperson said. However, a researcher who wants some information on a pilot who has just crashed will be faced with the same amount of digging as a historian looking for Amelia.

That registry, along with the aircraft registry — which keeps track of airplanes and their major mechanical components — and the main CPU are vulnerable. There are no backup sites, only paper files, according to Epperson. "If we went down, the agency goes. This is tornado alley," he said.

The CORN project is supposed to address the backup issue, Beavers said. But the new contractor may opt to take the installation away from Oklahoma City and tornado alley.

Beavers appears wistful about the possible demise of the Oklahoma City facility but looks forward to providing the services and response time expected of IS. "We used to be on top of technology, then everybody [in Congress] got into the business of controlling technology. Now the biggest hassle is trying to make sure there is something on the floor to meet our customers' needs," Beavers said.

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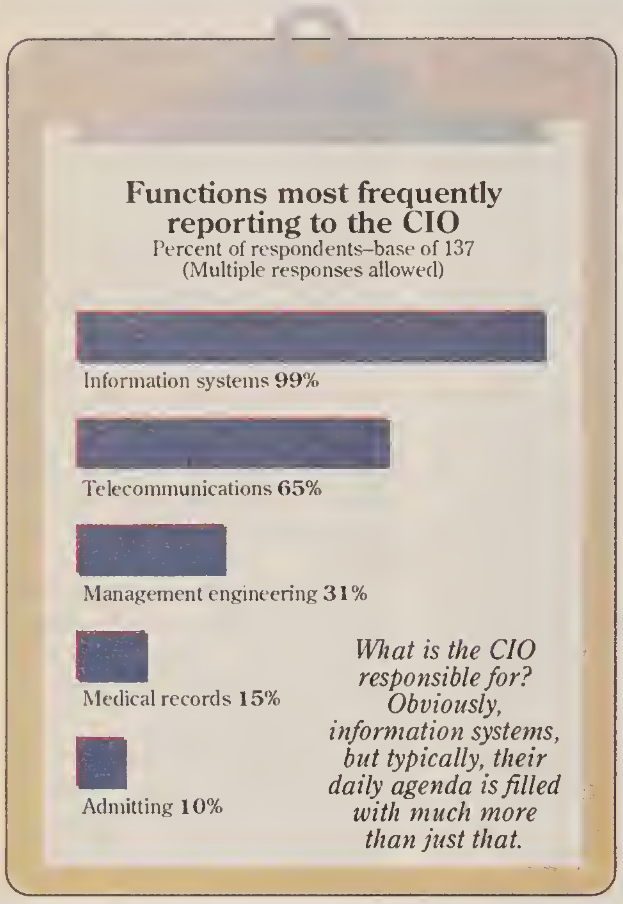
TRENDS

HEALTH CARE CIOs

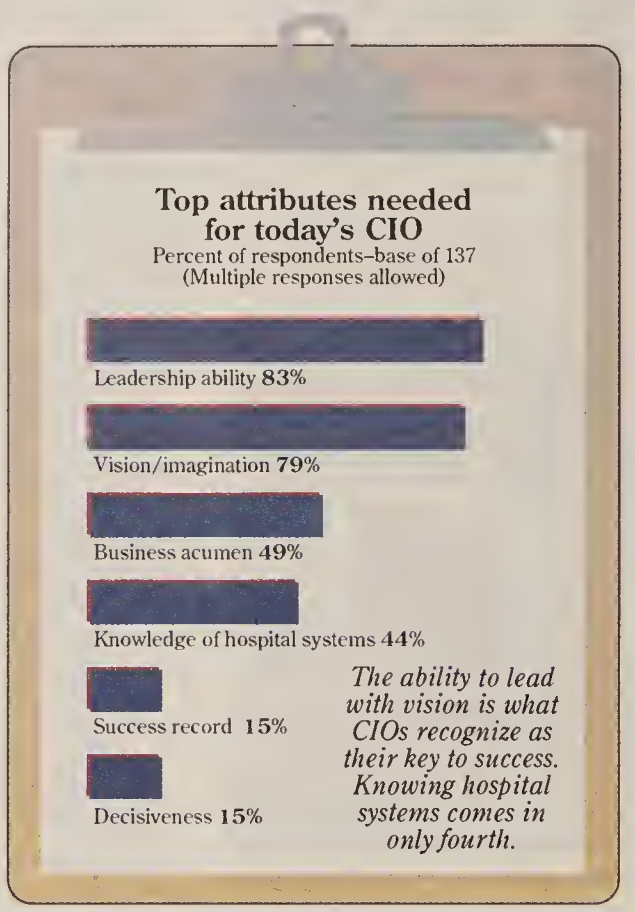
According to the latest survey conducted by Heidrick and Struggles, Inc., the typical chief information officer in the health care industry has been with his current organization an average of seven years and in his current post for four years.



Functions most frequently reporting to the CIO

Percent of respondents–base of 137
(Multiple responses allowed)

What is the CIO responsible for? Obviously, information systems, but typically, their daily agenda is filled with much more than just that.



Top attributes needed for today's CIO

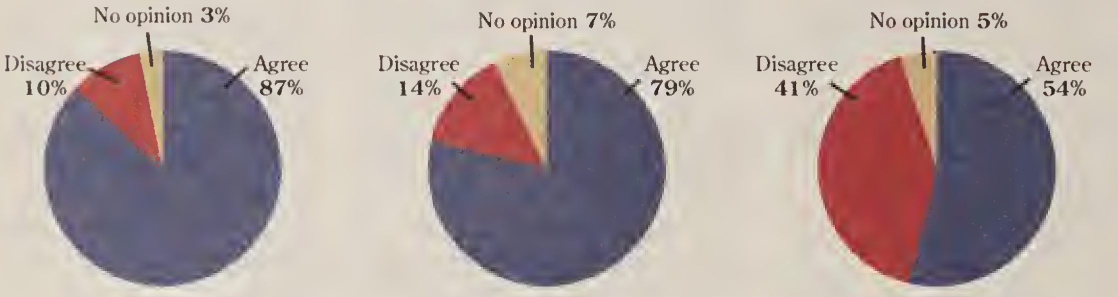
Percent of respondents–base of 137
(Multiple responses allowed)

The ability to lead with vision is what CIOs recognize as their key to success. Knowing hospital systems comes in only fourth.

The views of CIOs

Percent of respondents–base of 137

How do health care CIOs perceive themselves and the positions they hold? Several statements were put forward for their reaction.



CIOs should emphasize their strategic role rather than their managerial role.

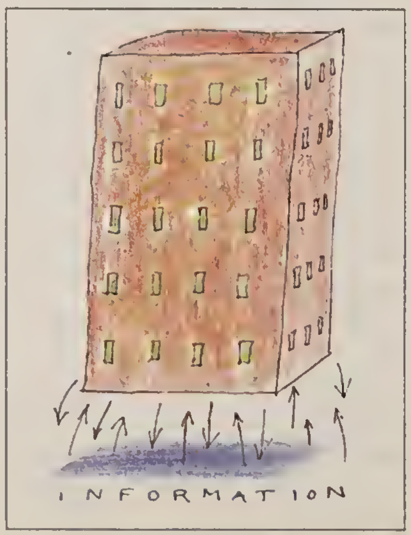
There will be an increasing percentage of health care CIOs who come from other industries.

The most important role of the CIO is to integrate the functions of information systems, management engineering and telecommunications.

Source: Heidrick and Struggles, Inc., Chicago, Ill.
CW Chart: Tom Monahan

NEXT WEEK

Organizations are built ▶ on lots of things: tradition, old money, hard work, etc. But tomorrow's best corporations will be built on *information*, according to David R. Vincent, Information Group president and consultant. See In Depth to find out why you should start construction now and the 10 key steps to creating a solid structure.



Michael Constable

Systems aren't the only things that are tied together in a systems integration project. In the majority of cases, such projects also involve linking up with an outside specialist. Executive Report focuses on ways in which you can decide which pieces of the job to keep and which would be better to consign out to contractors.

INSIDE LINES

Bank-vault hackers claim hit

Two hackers claim to have pocketed $66,000 apiece from Citicorp after illegally jacking into DEC VAXs on Citicorp's Decnet, which the multinational banking firm uses for electronic fund transfers, according to an account of the episode in an electronic newsletter published by The Legion of Doom. The hackers entered one of the VAXs, created a file to capture incoming and outgoing control sequences and then used the information to divert funds into a Swiss bank account, one of the hackers wrote. Citicorp has declined to comment on the claims.

Wall going back up?

It seems ironic that the complexities of meshing the two Germanies may be less formidable than those involved in creating a joint Unix Software Operation. The latest word on negotiations — under way since last fall between AT&T and the Open Software Foundation — is decidedly pessimistic. Organizational issues continue to block progress, according to sources close to the talks, and by one account, the effort is "blowing up." A USO spokesman said last week that negotiations are going forward, but "there are no great doves of peace flying over Morristown," the location of USO's New Jersey headquarters.

Evaluating options on Wall Street

The latest cuts at Shearson Lehman Hutton — 2,000 employees, which represents nearly 6% of the work force — will take their heaviest toll on the firm's real estate, investment banking, mortgage and merchant banking businesses. However, information systems may take some hits as well. Shearson's IS managers have been asked to re-evaluate their priorities as well as their staff members, according to one executive.

Waiting for the sequel

IBM told developers at its recent Palm Springs, Calif., confab that it will port OS/2 Extended Edition's Database Manager to AIX, meaning that at some point, users will be able to move files back and forth between the OS/2 desktop and an AIX environment. IBM did not give a date for when this would be ready, but it did say that by December 1991, users are expected to be able to issue an SQL command from the desktop and get to any other server, whether OS/2 or DB2, or follow it through AIX.

A timely ending in sight?

Lotus will introduce 1-2-3/VMS, a version of its spreadsheet that runs on a DEC VAX, next Monday. This Friday, Lotus will host a briefing for analysts, some of whom are expecting the spreadsheet maker to tip its hand on upgrades to Agenda and Magellan as well. After the 12th, the only remaining piece missing under the Lotus multiplatform strategy is a version for OS/2, 1-2-3/G. Lotus will be demonstrating 1-2-3/G out at the Guide show in San Franscisco.

Few flaws in these Windows

Forget April 17, but keep the first two weeks of May open. A recent Microsoft memo sent out to developers and interested parties says the software kingpin is scrambling to find hotel space during the first two weeks of May to unwrap what has to be one of the most leaked products ever — Windows 3.0. Some sources said Microsoft had vowed to ship the product by April 17, but a funny thing happened on the way to fixing some bugs in a beta version. Microsoft fixed the problem, but it also trashed protected mode, according to some developer sources.

For those who missed last week's 5.5 earthquake in Southern California, the Corporate Contingency Planning Seminar and Exhibition — a disaster recovery show — will be held 72 miles from the quake's epicenter. Planners are expecting some 350 slightly skittish attendees. If anything's making you skittish about the computer industry these days, contact us by fax (508-875-8931), MCIMail (address: Computerworld) or phone (800-343-6474) and News Editor Pete Bartolik will loose the news hounds.

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Whether it's designing, creating, financing, or delivering, no other supplier of microcomputer systems has all the right connections. Nobody else even comes close.

The answer is NYNEX.®

NYNEX Business Centers

The CFO says it better save money. The CEO says it better be right. And you've got a few priorities of your own.

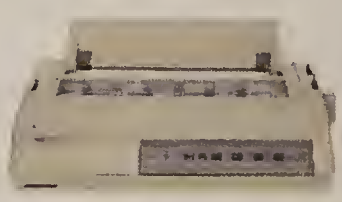
There are pressures and then there are pressures. Choosing a computer company has to rank high on the list.

But there are ways to deal with the pressure. And ways to make sure that both your CFO and CEO are very happy indeed.

That's where NEC comes in. We make a full line of high quality, industry-standard personal computers known as The PowerMate® Family. Portables or desktops, 286-based or 386-based, they give you the kind of speed, memory and graphics capabilities you need to tough it out in today's business environment. We also make a full line of printers. Pinwriter® dot matrix printers and Silentwriter® laser-quality page printers. Now if the phrase "legendary reliability and superior print quality" comes into mind, we're not all that surprised.

PowerMate SX Plus

PowerMate Portable Plus



Pinwriter P5300

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One more thing: NEC is a $24 billion world leader in computers and communications. And just knowing that can have a remarkable effect on one's blood pressure.

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